Cape Fear Technical Institute

Catalogue 1978-1979

State Board of Education
Raleigh, North Carolina

To Whomsoever These Presents May Come
Greetings: Know Ye That

Cape Fear Technical Institute

Is Chartered

By authority of the General Assembly of the State of North Carolina under the terms and provisions of Article 115-A of the General Statutes of said State as a public institution of the North Carolina Community College System having been Originally established on the 3rd day of April, in the year of 1958 as a tax supported institution under the style and title of

Wilmington Industrial Education Center.

In Witness Whereof and Certification Thereto, we the undersigned have subscribed our names this 4th day of June, Anno Domini 1964.

DIRECTOR
DEPARTMENT OF COMMUNITY COLLEGES

CHAIRMAN
STATE BOARD OF EDUCATION OF NORTH CAROLINA

CAPE FEAR TECHNICAL INSTITUTE

411 NORTH FRONT STREET

WILMINGTON, N. C. 28401

PHONE 919-343-0481

Cape Fear Technical Institute is a member institution of the North Carolina Department of Community Colleges—A fully accredited member of the Southern Association of Colleges and Schools—and is accredited by the North Carolina State Board of Education.

Catalogue of Information

1978-1979

"ADMISSION TO ANY AND ALL EDUCATIONAL PROGRAMS OFFERED BY CAPE FEAR TECHNICAL INSTITUTE IS MADE WITHOUT REGARD TO RACE, COLOR, SEX, RELIGION, NATIONAL ORIGIN, OR PHYSICAL HANDICAP."

General Information ..... White
Technical Curricula ..... Green
Trade Curricula ..... Yellow
Extension & General Adult Division ..... Blue

Volume XIII March 1978

PRIVACY RIGHTS ACT OF PARENTS AND STUDENTS

PUBLIC LAW 93-380

Cape Fear Technical Institute adheres to the Guidelines developed by the Department of Health, Education and Welfare regarding the Privacy Rights of Parents and Students.

The Institute provides students and parents of dependent students access to official records directly related to them and limits dissemination of personally identifiable information without the student's consent. Students enrolled at Cape Fear Technical Institute may review guidelines and procedures regarding Public Law 93-380 in the office of Admissions and Records.

NON-DISCRIMINATION POLICY

Cape Fear Technical Institute's Board of Trustees and Staff recognize the importance of equal opportunity in all phases of the Institute's operations and has officially adopted a position of non-discrimination on the basis of race, color, sex, age, religion, national origin or other non-relevant factors. This policy applies to both students and employees at all levels of the school's operations.

GIFTS TO THE INSTITUTE

The Cape Fear Technical Institute's Board of Trustees has approved the creation of the Cape Fear Technical Institute Foundation. Gifts made to this foundation are tax deductible for income tax purposes as provided by law. Anyone desiring information regarding gift opportunities, please contact the office of the President, Cape Fear Technical Institute, 411 North Front Street, Wilmington, North Carolina 28401, telephone 919-343-0481.

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Foreword

The Cape Fear Technical Institute was founded as an area school to meet the occupational training needs of the people of Southeastern North Carolina and of the growing industrial community.

Every effort has been made to provide the equipment, facilities and skilled teachers necessary to allow maximum opportunities for the people to develop new skills, up-date old skills, and further their knowledge to enhance their value to industry and promote their own personal growth.

North Carolina has the most valuable of all resources, a vast reservoir of good people who make fine citizens and excellent employees. Therefore, Cape Fear Technical Institute pledges itself to continue to do all in its power to provide the educational opportunities needed by people to meet the challenging needs of modern industry and help them grow in their understanding and enjoyment of life.

M. J. McLEOD
President

Note

The Cape Fear Technical Institute issues this catalogue for the purpose of furnishing prospective students and other interested persons with information about the institution and its programs. Announcements contained herein are subject to change without notice and may not be regarded in the nature of binding obligations on the Institute or the State. Efforts will be made to keep changes to a minimum, but changes in policy by the State Board of Education, the Department of Community Colleges, or by local conditions may make some alterations in curriculums, fees, etc. necessary.

Visitors

Visitors, and in particular prospective students, are always welcome at Cape Fear Technical Institute. The student affairs office will provide guide service for groups or individuals on week days between 8:00 a.m. and 5:00 p.m. The school is open until 10 p.m. and individuals may visit at their convenience. Questions about the school and its programs will be answered by someone from the student affairs office.

Statement of Policy

The contact hours shown in the catalogue are minimal. It is a policy of this institution to permit students to enroll in additional subjects and laboratory work beyond those shown in the catalogue.

When in any quarter the total weekly contact hours listed are fewer than twenty-five hours in a technical curriculum and fewer than thirty hours in a vocational trade curriculum, a student may enroll on request for additional instructional hours deemed by the institution to be consistent with the program and appropriate to the student to make up twenty-five hours per week in a technical curriculum or sufficient hours of attendance to make up thirty hours per week in a vocational trade curriculum.

Institutional Memberships

An Institutional Member of the American Association of Junior Colleges.

An Institutional Member of the American Technical Society.

An Institution of the North Carolina Department of Community Colleges.

Accredited by the Southern Association of Colleges and Schools.

Accredited by the North Carolina State Board of Education.

GENERAL INFORMATION

CAPE FEAR TECHNICAL INSTITUTE

SCHOOL CALENDAR

1978-79

FALL QUARTER

Freshmen orientation	September 1, 1978
Freshmen registration	September 5, 1978
Returning students registration	September 6, 1978
Classes begin	September 7, 1978
Classes end	November 22, 1978
Holidays	November 23 & 24, 1978

WINTER QUARTER

Pre-registration for Winter Quarter	November 21 & 22, 1978
Registration	November 27, 1978
Classes begin	November 28, 1978
Classes end	February 23, 1979
Holidays	December 20, 1978 through January 1, 1979

SPRING QUARTER

Pre-registration for Spring Quarter	February 22 & 23, 1979
Registration	February 26, 1979
Classes begin	March 5, 1979
Classes end	May 23, 1979
Holidays	April 13, 16 & 17, 1979

SUMMER QUARTER

Pre-registration for Summer Quarter	May 22 & 23, 1979
Registration	May 24, 1979
Classes begin	June 1, 1979
Classes end	August 17, 1979
Holiday	July 4, 1979

STATE ADMINISTRATION

Benjamin E. Fountain, Jr.—State President, Department of Community Colleges

STATE BOARD OF EDUCATION

H. David Bruton ..... Southern Pines, Chairman, District 4
John A. Pritchett ..... Windsor, Vice-Chairman, District 1
James C. Green ..... Lieutenant Governor, Ex Officio
Harlan Boyles ..... State Treasurer, Ex Officio
Larry M. Harding ..... Charlotte, District 6
R. Barton Hayes ..... Hudson, District 7
R. R. Manz ..... Roanoke Rapids, District 3
Earl Oxendine ..... Raeford, District 4
Mrs. Evelyn S. Tyler ..... Greensboro, District 5
Ben H. Battle ..... Asheville, District 8
John Tart ..... Smithfield, District 2
Dr. Prezell R. Robinson ..... Raleigh, Member-at-large
C. R. Edwards ..... Fayetteville, Member-at-large
A. Craig Phillips ..... Secretary to the Board

LOCAL BOARD OF TRUSTEES

Richard L. Burnett, Chairman, 6 Robert E. Lee Dr., Wilmington, N. C.
W. Mercer Rowe, Vice-Chairman, South Atlantic Services, Inc., P. O. Box 1886, Wilmington, N. C.
James F. Bradshaw, Jr., P. O. Box 307, Burgaw, N. C.
Dr. Hubert A. Eaton, Jr., 411 N. 7th St., Wilmington, N. C.
William T. Emmart, 1924 Knollwood Rd., Wilmington, N. C.
G. W. Graves, Graves Electric Company, Wilmington, N. C.
Mrs. Peter P. Jones, 2514 Mimosa Place, Wilmington, N. C.
Charles S. McCandlish, DuPont, Cape Fear Plant, Wilmington, N. C.
Eugene McWatty, S & G Concrete, 2307 Mimosa Place, Wilmington, N. C.
Mrs. Conrad B. Schwarz, 1207 Columbus Circle, Wilmington, N. C.
Mrs. Joseph M. Schwartz, 1920 S. Churchill Dr., Wilmington, N. C.
Berry A. Williams, Rippy Cadillac Olds., 3720 Carolina Beach Rd., Wilmington, N. C.

ADMINISTRATION

M. J. McLeod ..... President
Ronald G. Mihal ..... Administrative Assistant
Mrs. Macque C. Cockman ..... Director of Attendance Record Audit Section
Mrs. Amelia S. Dixon ..... Scheduling Technician
Clarence E. Dodgens ..... Vice President
Ralph Bordeaux ..... Director of Evening Programs
Dan H. Hickman ..... Supervisor of Evening Instruction
Matthew C. Donahue ..... Dean of Curriculum Programs
Captain Arthur W. Jordan ..... Coordinator of Ship Operations & Chief Investigator for Sea Grants
E. T. Satterfield, Jr. ..... Dean of Student Affairs
Carl E. Malpass ..... Asst. Dean of Student Affairs—Counselor
Robert D. Bass ..... Registrar
Henry J. Bethea ..... Coordinator of Student Activities
Charles F. Hunnicutt ..... Counselor
Joseph S. Moorefield ..... Evening Counselor
Thomas A. Olson ..... Veterans Coordinator
Mary B. Rea-Poteat ..... Director of Testing and Placement
Miss Naomi Randolph ..... Counselor

Kenneth D. Futch ..... Dean of Continuing Education
Michael G. Bonner ..... Director of Continuing Education—West Pender
John J. Braswell ..... Director of Continuing Education—East Pender
Fitzhugh Fennell ..... Director of Continuing Education—New Hanover
Mrs. Barbara Yount ..... Director of Continuing Education—S. Brunswick
K. D. Futch ..... Director of Continuing Education—N. Brunswick
Mrs. Nell Pavelchak ..... Supervisor of Law Enforcement & EMT
Odis R. Stewart ..... Director of Human Resources and Development
S. C. Coleman ..... Dean of Fiscal Affairs
Walter J. Thomas ..... Assistant Dean of Fiscal Affairs
Mrs. Sadie M. Lea ..... Bookkeeper
Mrs. Gwendolyn Murray ..... Bookkeeper
Willie B. McGough, Jr. ..... Director of Library Learning Resource Center
Roy T. Barnhill ..... Print Resources Librarian
Audio-Visual Resources Librarian

AREA COORDINATORS

John R. Willis ..... Fishing Trades
Ralph W. Roper ..... Police Training

LIBRARY LEARNING RESOURCE CENTER

Willie B. McGough, Jr. ..... Director of Library Learning Resource Center
Roy T. Barnhill ..... Print Resources Librarian
William Crawford ..... Audio-Visual Resources Librarian
Mrs. Alta W. Moore ..... Library Technician
Nixon B. Howard ..... Production Technician

PROGRAMMED INSTRUCTION CENTER

Miss Charlotte Dexter ..... Head, Programmed Instruction Centers
Thomas J. Bradshaw ..... Coordinator
Ernest D. Bryant ..... Coordinator
James Canty, Jr. ..... Coordinator
Christopher K. Zingelmann ..... Coordinator

STAFF-SPECIAL PROGRAMS

Walter K. Gaylor Evaluator-Coordinator of Disadvantaged & Handicapped Programs
Charles W. Miller ..... Coordinator of Disadvantaged & Handicapped Programs
Frances N. Teachey ..... Basic Job Instructor
Rick Stewart ..... Director of Human Resource Development
Jody Bonner ..... HRD Instructor
Clarence Smith ..... HRD Instructor

FACULTY BY DIVISIONS

BUSINESS EDUCATION

Sessoms, Robert W., Division Director ..... Accounting
Armstrong, Gwendolyn M. ..... Business Related
Barefoot, Emily W. ..... Typing and Related
Canty, Katie G. ..... Business Related
Coleman, Mary D. ..... Business Related
Tyndall, Roland E. ..... Typing and Related
West, Geraldine J. ..... Shorthand and Related

ENGINEERING

Batts, Chauncey W., Jr., Division Director ..... Drafting
Bailey, James ..... Criminal Justice
Buck, Dale ..... Chemistry
Buis, Charles ..... Drafting
Carter, Scott ..... Industrial Maintenance
Coleman, William H., Jr., Department Head ..... Electronics
Holt, Russell ..... Electronics
Horton, Grag ..... Heating and Air Conditioning
McGowan, Delmar ..... Drafting
Rochelle, Edward ..... Industrial Electricity
Simmons, Wayne P. ..... Electronics Servicing
Stroman, Arthur W., III ..... Electronics and Related
Welchel, Thomas P. ..... Electronics Computer Technician
Wells, Connie ..... Chemical Technician

MARINE

Foss, Edward L., Division Director ..... Oceanography
Brandi, Raymond P. ..... Marine Technician
Bryan, Joseph T. ..... Navigation
Carter, Mrs. Shirley Marie ..... Marine Technician
McClelland, Roy K. ..... Marine Engineer
Martin, James R. ..... Biology
Miller, Mark ..... Fishing Trades
Price, Henry ..... Marine Electronics
Raynor, Bruce ..... Assistant to the Coordinator of Ship Operations
Rhodes, Samuel T. ..... Biology

MARINE TRADE

Jordan, Captain Arthur W., Division Director ..... Marine Related
Clark, Kenneth ..... Commercial Fishing
Gillette, Milton S. ..... Commercial Fishing

MECHANICAL

Klimek, Francis B., Division Director ..... Automotive Mechanics
Nunn, James R. ..... Machine Trades
Poythress, Marion T. ..... Marine and Diesel Mechanics
Watters, James L. ..... Welding
West, Richard ..... Welding
Williams, Alvin ..... Welding

MEDICAL EDUCATION

DuMond, Sandra Z. ..... Nursing Education
Jackson, Marjorie S. ..... Nursing Education

RELATED INSTRUCTION

Averette, Roger H., Division Director ..... Physics
Barker, William G., Department Head-Academic ..... Mathematics
Bright, Ladson ..... English
Cooper, Claude ..... Social Studies
Cooper, Ida ..... English
Entwistle, Joyce ..... English

Jorgensen, Philip C. ..... Mathematics and Science
Kellagher, Richard ..... Trade Related
Mangum, William A. ..... Mathematics
Marteney, Lawrence L., Department Head—
Mechanical & Engineering ..... Technical Related
Seeger, David C. ..... Related Subjects
Thompson, Aubrey ..... Physics
Thompson, Sonya ..... Technical Related
Wasson, Mary ..... English

SHIP'S PERSONNEL

Jordan, Captain Arthur W. ..... Coordinator of Ship Operations & Chief Investigator for Sea Grants
Bennett, Jr., George K. ..... Captain of Advance II

Deck Department

Beuth, Stephen J. ..... Chief Mate
Roberts, John C. ..... Bosun

Steward's Department

Garrison, William A. ..... Chief Cook
Fisher, Wallace L. ..... Officer's Steward

Engineering Department

Bryant, Jesse H. ..... Chief Engineer
Anderson, David S. ..... First Assistant Engineer

Specialists

LaDue, Claude ..... Ship's Electrician
Malpass, Mitchell ..... Oceo. Technician
Raynor, Bruce A. ..... Assistant to Coordinator of Ship Operations
Weddle, Daniel J. ..... Electronics Technician

THE SCHOOL

HISTORY

The Cape Fear Technical Institute was established as the Wilmington Industrial Education Center in 1959 under the direction of the late George H. West. It was raised to technical institute status on July 1, 1964.

Cape Fear Tech is one of more than fifty such institutions operated by the State under the direction of the State Board of Education and the Department of Community Colleges in Raleigh. The school is administered by a local Board of Trustees.

Authority for the establishment and operation of these institutions is found in Chapter 115A of the General Statutes of North Carolina and the amendments thereto.

The Institute was one of the original industrial education centers and was operated from 1959 through the 1963 school year by the New Hanover Board of Education. Following a favorable vote of the citizens of the County on a $575,000 bond issue to provide a technical institute facility, and a 2¢ tax levy for its support, the State Board of Education authorized $500,000 in matching funds from the 1963 Vocational Education Act Appropriation to be applied toward the facility construction. The Institute continued to operate in the County owned buildings until the new facilities were completed in the summer of 1967. The new facilities included a four story main building, a separate automotive shop, and a pier and docking facility for the school's ship, the Advance II. In the general election of 1972 the citizens of New Hanover County approved a bond issue of $3,675,-000.00 for the expansion of Cape Fear Technical Institute's facilities. The new classroom and shop facilities have been completed allowing for valuable classroom, shop and office space.

The number of people served annually by the Institute has risen from approximately 750 during its early years of operation to more than 14,000 in recent years. The school has been and continues to be dedicated to total education for adults in the area it serves.

PURPOSE

Cape Fear Technical Institute is comprehensive in its purpose and in its plan to meet the needs of the adult population within the community it serves. The Institute provides flexible programs designed to meet these adult educational needs through:

(1) A continuing concern for the total welfare of each student including his physical and mental health, development of

capacities and talents, establishment of relationships with other persons, and motivation for progress in intellectual understanding.

(2) Various vocational-technical and trade programs which will prepare a student for employment in a specialized field.

(3) Courses and programs for the adult student who wishes to further his education at the elementary and secondary level, or for an adult who wishes to improve his economic, social, or cultural needs.

(4) Programs to serve new and existing industries by training new employees and upgrading others.

(5) Programs to serve the community by training employees for public services.

(6) Continuous curriculum study and revision of existing programs to meet the needs of the community.

Finally, the Institute strives to live up to the "open door" admissions policy established by the North Carolina Department of Community Colleges. The Institute is concerned with the student's willingness to do, and with providing entry programs at all capability levels. The Institute encourages the student to develop abilities and attitudes which will make him feel that he is a participating, worthwhile, dignified member of his community.

LOCATION

The Cape Fear Technical Institute is conveniently located in the heart of Wilmington on North Front Street. The campus extends from Front Street to the deep water channel of the Cape Fear River, and is bordered by Red Cross Street on the North and Walnut Street on the South. Some parking space is available on the campus, public transportation is nearby, and hotels, motels, restaurants, theaters, and shops are all within easy walking distance.

The main building houses the administrative offices, business office, classrooms, and part of the shop areas. The new south wing houses the student affairs offices, library, laboratories, classrooms, and the student lounge area. An additional shop building is located at the water's edge, and a pier extends out to the deep-water channel to provide mooring for the 185-foot school ship, the SS Advance II. The buildings are of all-masonry construction, and designed especially for trade and technical programs. All classrooms and offices are air-conditioned for year-round comfort.

The Wilmington area has abundant recreational facilities, excellent beaches, salt- and fresh-water fishing, good hunting area; year-round

golf courses and tennis courts are all located within a few minutes driving range.

SHOPS & EQUIPMENT

The shops and laboratory areas were carefully planned to provide large, well-ventilated, and industry-type training facilities.

Equipment for all shops, laboratories, test areas, drafting rooms, and for the training ships was selected to conform with the current tools and devices of industry. Students will find that ample opportunity is provided in all trade and technical curricula for skill-building practice in using modern, industrial, production and testing tools and machines. Specially planned and equipped classrooms are conveniently located for study of the academic related subjects, and a well-stocked technical library is available both day and night for use by faculty, students and area residents.

QUARTER SYSTEM

The school year is divided into four quarters of 55 school days. Credits earned are in quarter hours. See course description section for number of credits required for graduation in each program.

AREAS OF STUDY

Technical and trade curriculums which the Institute is presently authorized to offer include the following:

Technical Curricula:

See technical section (Green) of catalogue for descriptions.

Business Administration
Criminal Justice Technology
Drafting & Design Technology
Electronics Technology
General Occupational Technology
General Office Technology
Instrumentation Technology
Manufacturing Processes Control Technology (Chemical Tech.)
Marine Construction Engineering Technology
Marine Electronics (Special Technology, one quarter only)
Marine Laboratory Technology
Marine Technology
Secretarial-Engineering and Technical

Persons graduating from these technical curriculums are awarded the Associate in Applied Science Degree:

Vocational Curricula:

See trade section (Yellow) of catalogue for descriptions.

Automotive Mechanics
Boat Building
Commercial Fishing
Drafting, Mechanical
Electronics Servicing
Heating and Air Conditioning
Heavy Equipment Mechanics (Offered Periodically)
Industrial Electricity
Industrial Air Conditioning (6 months)
Industrial Machine Operator (6 months)
Machine Trades
Marine and Diesel Mechanics
Marine Maintenance and Related Occupations
Operating Room Assistant (Offered Periodically)
Practical Nurse Education
Welding

A diploma is earned by graduates of these vocational programs.

ENTRANCE REQUIREMENTS

All correspondence concerning admissions should be addressed to The Admissions Office.

ADMISSION OF NEW STUDENTS—The Cape Fear Technical Institute follows the "Open Door" policy established by the State Board of Education. This policy provides for the admission of any North Carolina citizen who has reached the age of 18, or whose high school class has graduated. This policy is based on the belief that the school has something to offer at all educational levels and that through effective guidance a person can find his or her place in the proper educational program.

While a high school education or its equivalent* is desirable for admission to the full-time training programs, some exceptions are made for individuals whose age and maturity make success in a diploma program likely.

See individual course description in this catalogue for specific admission requirements, prerequisites, etc., for each course.

ADMISSION CRITERIA

1. Previous Education—Each applicant shall request his or her high school to submit a transcript of grades. Those who are high school

*See page 178 in General Adult Education Section of this catalogue for details about the high school equivalency certificate.

seniors should have their school submit a transcript showing work through the first semester of the senior year as soon as possible after the semester has ended, and a supplementary transcript showing graduation at the close of school.

Applicants who have the high school equivalency certificate* should submit a copy of the certificate, but should also ask their high school to send transcript of all work done at the school.

Transcripts of previous education in colleges, technical institutes, etc., should also be submitted to the school. All transcripts must come directly from the school to the Technical Institute and not from the applicants themselves.

2. **Placement Test**—Students are required to take placement test/s prior to entrance. Qualified counselors at the school use the test results in helping individuals decide which course of study to follow. There is no charge for the test, nor for the counseling service.

3. **Personal Interview**—The personal interview is beneficial to both the applicant and to school officials in that it affords an opportunity to "get acquainted." The applicant has an opportunity to ask questions about the school and its programs while school officials make an effort to evaluate the applicant's interest in, and capability to pursue the program of study applied for.

4. **Medical**—Complete medical form provided by the school.

5. **Complete residence status form.**

ADMISSION OF OUT-OF-STATE STUDENTS

Out-of-state students are admitted under the same regulations as others. Tuition and fees are established by the State Board of Education.

1. **General.** The tuition charge for legal residents of North Carolina is less than for non-residents. To qualify for in-state tuition a legal resident must have maintained his domicile in North Carolina for at least 12 months immediately prior to his classification as a resident for tuition purposes. In order to be eligible for such classification, the individual must establish that his or her presence in the State during such twelve-month period was for purposes of maintaining a bona fide domicile rather than for purposes of mere temporary residence incident to enrollment in an institution of higher education.

2. **Domicile.** Domicile means one's permanent dwelling place of indefinite duration, as distinguished from a temporary place of abode.

3. **Burden of proof and statutory presumptions.** The burden of establishing facts which justify classification of a student as a resident entitled to in-state tuition rates is on the applicant for such

*See page 178 in General Adult Education Section of this catalogue for details about the high school equivalency certificate.

classification. Proof of residential status is controlled, initially, by two statutorily prescribed complementary presumptions, which are stated in terms of prima facie evidence:

a. If the parents or court-appointed legal guardian of the student (without reference to the question of whether the student is a minor or an adult) are not domiciliaries (legal residents) of North Carolina, such fact shall constitute prima facie evidence that the student is not a domicilary (legal resident) of North Carolina, and the student must assume the burden of rebutting the prima facie showing by producing evidence that he, independently is in fact a domiciliary (legal resident) of North Carolina, in spite of the nonresidential statue of his parents:
b. Conversely, if the parents of the student are domiciliaries of North Carolina, such fact shall constitute prima facie evidence that the student is a domiciliary of North Carolina. If the student has neither parents nor legal guardians, the prescribed concept of prima facie evidence cannot and does not apply.

4. Minors. A minor is any person who has not reached the age of eighteen years. The domicile of a minor is that of the father. With a few exceptions noted below, this presumption is virtually irrebutable. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order; or, the domicile of the minor is that of the parent with whom he lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father. Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his parents as to enjoy a species of adulthood for legal purposes. The consequences, for present purposes, of such circumstances is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile in fact has been established. The circumstances recognized as having the potential emancipating effect are:

a. Marriage of the minor person;
b. Parental disclaimer of entitlement to the minor's earnings and the minor's proclamation and actual experience of financial independence from his parents, with the actual establishment and maintenance of a separate and independent place of residence.

5. Married Women. The domicile of a wife is presumed to follow that of her husband; the converse is not presumed. The significance of

the marital relationship is limited to use of the presumption that a woman who marries a North Carolina domiciliary becomes, by virtue of such marriage, a domiciliary of North Carolina. Under such circumstances, the wife still must maintain that status for a minimum period of twelve months before she is eligible to be classified as a resident for tuition purposes.

6. Military Personnel. The domicile of a person employed by the Federal Government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile for himself by the usual requirements of residential act plus intent. No person shall lose his in-state resident status by serving in the armed forces outside of the State of North Carolina.

7. Property and Taxes. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

8. Change of Status. A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) shall be classified by the admitting institution either as a resident or as a non-resident for tuition purposes prior to actual matriculation. A residential classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

9. Responsibility of Students. Any student or prospective student in doubt concerning his residence status must bear the responsibility for securing a ruling by stating his case in writing to the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Office of Admissions of this circumstance in writing. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

10. Appeals of Rulings of Admission Officers. A student appeal of a classification decision made by any admissions officer shall be filed by the student with that officer in writing and shall be transmitted to the Residence Status Committee by that officer, who shall not vote in that Committee on the disposition of such appeal. The student shall be notified of the date set for consideration of the appeal and, on request of the student, he or she shall be afforded an opportunity to appear and be heard by the Committee. Any student desiring to appeal a decision of the Residence Status Committee shall

give notice in writing of that fact within 10 days of receipt by the student of the decision of the Residence Committee, and the basis for such appeal, to the Chairman of the Residence Committee, and the Chairman shall promptly transmit the appeal to the State Residence Committee.

Regulations concerning the classification of students by residence for purposes of applicable tuition differentials, are set forth in detail in **A Manual To Assist The Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes**. Each enrolled student is responsible for knowing the contents of this **Manual**, which is the controlling administrative statement of policy on this subject. Copies of the **Manual** are available on request in the Student Affairs Office.

ADMISSION OF TRANSFER STUDENTS — The Admissions Counselor and Subject Instructor will review applications for admissions with advanced standing. Where subject content and length of course are comparable with those in the curriculum applied for, credit may be allowed for grades of "C" or above. Transfer credit will not influence the students grade point average while at Cape Fear Technical Institute. In certain cases where the school and the student believe an alternate course would be more beneficial to the student, such alternate course may be allowed.

ADMISSION OF SPECIAL STUDENTS—Students entering a diploma or degree program will be allowed to take up to 12 quarter hours credit before submitting all admissions requirements.

ADMISSION OF FORMER STUDENTS—All former students who left the school in good standing are encouraged to enroll for additional study at the Institute.

ADMISSION OF NON-IMMIGRANT ALIEN STUDENTS—"This school is authorized under Federal law to enroll non-immigrant alien students."

TRANSFER WITHIN THE INSTITUTE—Students that desire to change from one program to another may have their records reviewed for possible transfer of credit. In cases where grades are acceptable, and prior course work is applicable to the new curriculum, transfer may be allowed. Transfer of credits will not influence the student's Grade Point Average in the new program.

PROFICIENCY EXAMINATION—Credit by proficiency examination may be given for a course. Eligibility to take a proficiency examination may be based on high achievement in secondary schools, post secondary schools, or experience. Arrangements for examination should be made with the major subject instructor, Division Chairman

and Dean of Student Affairs.

FRESHMAN ORIENTATION—Freshman Orientation is provided for full time students entering CFTI for the first time. Orientation informs the student about the academic and social policies of the Institute, and acquaints him with the library and other facilities. Upper-classmen assist in orientation and help answer questions about the Institute's policies and procedures.

REGISTRATION—Students who have been admitted, and who have paid their tuition deposit (see page 22 for information on this deposit) will register on the dates set by the school for this purpose. Students will obtain their class schedules, pay their fees and purchase their books. Late registrants are charged a $5.00 late registration fee.

COURSE LOAD—A Student who carries a minimum of 12 quarter hours is considered a full time student. The normal load is 14-18 quarter hours. A student may carry a maximum of 24 quarter hours credit. Any exception to this rule must be approved by the Dean of Student Affairs Office.

AUDITING COURSES—Students who wish to audit courses must register for the audit by following the regular registration procedures. Auditing students receive no credit and are not required to participate in class discussion or take tests. The fees for audit courses are the same as those taken for credit.

DROP-ADD PERIOD—Students will be allowed to drop or add courses within 10 calendar days from the date the classes begin.

HOW MUCH DOES IT COST?—All fees are established by the State Board of Education. Currently tuition is charged at the following rates for all curriculum courses:

North Carolina Students:
Full Time.....$39.00 per quarter
Part Time..... $3.25 per quarter hour credit

Out-of-State Students:
Full Time.....$198.00 per quarter
Part Time..... $16.50 per quarter hour credit

Books and small tools are purchased by students as they are needed. The Institute attempts to keep the cost of books and tools at a minimum. A $5.00 activity fee is charged at the beginning of each Fall, Winter and Spring quarter to students taking 9 or more credit hours.

Degrees, diplomas, caps and gowns are ordered directly from a company representative during the spring quarter of each year. The cost of these items is not included in the activity fee, but is paid directly

by the student to the company representative at the time of order.

All students who work in laboratories or shops should purchase accident insurance; this insurance presently costs $5.00 per year. The cost of insurance is subject to change as determined by the company offering the coverage. Students may purchase 24 hour coverage for $26.00 per year.

WHEN ARE PAYMENTS MADE?

When an applicant is officially admitted to a course of study, he is required to make a $15.00 tuition deposit. This deposit is non-refundable except in cases where the school is unable to admit the person or unable to offer the course applied for.

All tuition and fee charges are due and payable on the day of registration; however, in circumstances beyond a student's control, monthly payments may be permitted. Any deferred payments or exceptions to rules on financial affairs must be approved by the Dean of Fiscal Affairs.

The accident insurance is purchased on registration day of the first quarter of attendance.

No student will be permitted to graduate, nor will a transcript be issued until all financial obligations to the school are satisfied.

REFUND

Tuition refund for students shall not be made unless the student is, in the judgment of the institution, compelled to withdraw for unavoidable reasons. In such cases, two-thirds (2/3) of the student's tuition may be refunded if the student withdraws within ten (10) calendar days after the first day of classes as published in the school calendar. Tuition refunds will not be considered after that time. (Tuition refunds will not be considered for tuitions of five dollars ($5.00, or less, except if a course or curriculum fails to materialize, all the students' tuition shall be refunded.)

Where a student, having paid the required tuition and fees for a quarter, withdraws from the institution before the end of the quarter and the reasons for the withdrawal are found excusable by the institution's administration, the student may be allowed credit for unrefunded tuition and fees if he applies for re-admission during any of the next four calendar quarters and petitions in writing to be allowed such credit.

STUDENT FINANCIAL AID

Limited financial aid is available through gifts or loan funds provided by individuals or civic groups. This program is administered

through the services of a Financial Aid Officer located in the Student Personnel Division.

It is required that each applicant for financial assistance complete and submit the Financial Aid Form (FAF) to the appropriate College Scholarship Service Office. The Financial Aid Form can be obtained by writing the Office of Financial Aid, Cape Fear Technical Institute.

The financial aid program is as follows:

1. East Wilmington Rotary Club Loan Fund.

Loans are made to students recommended by the school. No interest is charged while the student is in school.

2. Wilmington Jaycee's Scholarship Fund.

The Jaycees have made available scholarships to be used for paying tuition. The extent of these scholarships are determined by the amount of funds available.

3. Wilmington Chapter of the National Association of Women in Construction Scholarship.

The Wilmington Chapter of Women in Construction makes available a scholarship to any student who is studying in a construction related curriculum. At the present time any student in either the Drafting Programs, Heating and Air Conditioning, or Marine Construction Engineering Technology is eligible to apply for the scholarship. Selection of the scholarship recipient is made by the Financial Aid Officer. Eligibility for the scholarship is based on the following criteria: (1) appropriate curriculum, (2) financial need, (3) must show educational promise.

4. Cape Fear Lion's Club Scholarship Fund.

The Cape Fear Lion's Club makes available a novel idea in student aid in that a prospective student with a visual handicap or whose parents have a visual handicap will receive a scholarship to be used for paying tuition. The extent of this scholarship will be determined by the amount of funds available.

5. Eastern Carolina Section of the American Welding Society Scholarship.

The ECSAWS has made available a scholarship in the amount of $150.00. To be eligible for this scholarship, a student must be: (1) in full time Welding program, (2) of financial need, (3) a resident of New Hanover, Pender or Brunswick County.

6. Wilmington Chapter of the North Carolina Jr. Sorosis Scholarship.

The Wilmington Chapter of the N.C. Jr. Sorosis awards a $99.00 scholarship to a needy student at Cape Fear Technical Institute. The

student must be enrolled in the second year of his or her curriculum. Selection of the scholarship recipient is made by the Director of Financial Aid. Eligibility for the scholarship is based on the following criteria: (1) Second year student in chosen curriculum, (2) must be of financial need, (3) resident of New Hanover County, (4) must show educational promise.

7. **North Carolina Junior Sorosis-Wilmington Juniorettes Scholarship.**

The North Carolina Junior Sorosis-Sub.-Junior made available a scholarship for tuition payment each quarter. This group is made up of high school students and is directly affiliated with the North Carolina Junior Sorosis organization. Selection of the scholarship recipient is made by the Financial Aid Director. To be eligible for the scholarship, the following criteria are required: (1) Demonstrate substantial financial need, (2) has to be a Practical Nursing student, (3) preferably a resident of New Hanover County.

8. **The Roger A. Greenleaf, Jr. Memorial Loan Fund.**

This loan fund has been established through Mr. Roger A. Greenleaf, Sr., a former staff member at Cape Fear Technical Institute. The loan is in the amount of $250.00. This loan is to be awarded to a full time second year student in a Technical Curriculum. This student must be classified as a North Carolina resident. The criteria for selection of the loan recipient are: (1) financial need, (2) academic standing.

Further information concerning this loan can be obtained from the Financial Aid Office located in the Division of Student Affairs.

9. **The Owen Sullivan Eckhardt Memorial Loan Fund.**

This loan fund has been established in memory of Owen Sullivan Eckhardt, a former instructor at Cape Fear Technical Institute. The loan is in the amount of $150.00. This loan is to be awarded to a full-time second year student in the Manufacturing Process Control Technology Program. (In the event that there is not an eligible second year student in the MPCT program, a full-time second year student in any other Technical Curriculum may be awarded this loan.) This student must be classified as a North Carolina resident. The criteria for selection of the loan recipient are: (1) Financial Need, (2) Academic standing (GPA of at least 1.50).

10. **Supplemental Educational Opportunity Grant.**

The SEOG program was established by Title IV, Part A, of the Higher Education Act of 1965 (Public Law 89-329). The maximum grant is $1,500 and minimum grant is $200. Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from

participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance." Therefore, the SEOG program, like the Department of Health, Education and Welfare, must be operated in compliance with this law. The SEOG shall be made for the period required by the student to complete his course of study. In no event should such a period exceed four academic years.

To be eligible for a SEOG, a student must be: (1) a high school graduate or equivalent, (2) a national of the United States, or is in the United States for other than a temporary purpose and intends to become a permanent resident thereof, (3) a full time student in either the degree or diploma programs, (4) of academic or creative promise, and capable of maintaining good standards in his course of study, (5) of exceptional financial need and would not be able to attend the Institute without such a grant.

11. Basic Educational Opportunity Grant Program.

The purpose of the Basic Educational Opportunity Grant program is to make available grants to qualified students in Title IV, Part A of the Educational Amendments of 1972. The maximum amount of the grant is $1,600 less the parental contribution. The Grant cannot exceed one-half the costs of the education.

To be eligible to receive this grant the student must meet the following qualifications: (1) must be of financial need, (2) must be a student carrying at least a half time work load as determined by the Institute, (3) must be capable in the opinion of the Institute of maintaining good standards, (4) must be a national of the United States, or a person who is in the United States for other than a temporary purpose and intends to become a permanent resident thereof. Persons who are in this country on an F student Visa or a Visitor Visa are not eligible.

12. College Work-Study Program.

The purpose of the College Work-Study Program is to make available to students the opportunity to work part time while attending an institution of higher education. The CWSP is particularly for those students from low income families. Students are allowed to work part time for any non-profit organization at an hourly rate of $2.65. Eligibility for the CWSP is based on the following qualifications: (1) Need of the earnings from such employment in order to pursue a course of study at the Institute, (2) capable, in the opinion of the Institute, of maintaining good standing in such course of study, (3) accepted for enrollment as a full time student at the Institute or in good standing, (4) a national of the United States, or in the United States for other than a temporary purpose and intends to become a permanent resident thereof.

13. National Direct Student Loan.

The purpose of the NDSL is to make loans available to qualified students in need of financial assistance to pursue a course of study on at least a half time basis at this school. These loans are made on a long-term and at a low interest rate. The maximum amount available to students in two academic years is $2,500.

To be eligible for this loan, a student must be: (1) of financial need, (2) a student carrying at least a half time work load as determined by the Institute, (3) a national of the United States, or a person who is in the United States for other than temporary purpose and intends to become a permanent resident thereof. Persons who are in this country on a F Student Visa or a Visitor Visa are not eligible, (4) No student of Medicine, Dentistry, Osteopathy, Optometry, Podiatry, Veterinarian medicine, or Pharmacy who is eligible to receive a loan from a fund establishment under the Health, Student Loan Program at the Institute he is attending will be eligible for this loan.

14. North Carolina Student Incentive Grant Program.

The purpose of the North Carolina Student Incentive Grant Program is to provide grants to legal residents of North Carolina who qualify. These funds are provided by the North Carolina Education Assistance Authority under the Higher Education Act of 1965. The grant cannot exceed $1,500 per academic year.

To be eligible to receive the grant the student must meet the following qualifications: (1) Legal resident of North Carolina, (2) demonstrate substantial financial need, (3) must be registered for a full-time work load as determined by the Institute, (4) must show and maintain good standing at the school.

15. College Foundation, Inc. Loan.

The insured student loan program is administered in North Carolina by the College Foundation, Inc., through the State Education Assistance Authority. Participating North Carolina banks and life insurance companies provide for the student loans and these are available to any North Carolina student under terms and conditions set by College Foundation. Loans cover educational expenses for one year including tuition, books, and activity fee plus any allowances for travel and living expenses. Residents of North Carolina enrolled full time may borrow up to $2,500 per academic year. To be eligible for this loan, a student must be: (1) a full-time student, (2) must be a legal resident of North Carolina, (3) must show and maintain good standing at this school.

16. Scholarships for Children of N. C. War Veterans.

The Division of Veterans Affairs of the North Carolina Department of Administration administers a program of scholarships for children

of certain categories of deceased, disabled, or POW/MIA veterans from North. These scholarships, when used at a public institution of higher learning, range from free tuition and exemption from certain mandatory fees to a reasonable room and board allowance, depending on the class of scholarship awarded. The scholarships are not to extend for a period longer than four academic years, which years, however, need not be consecutive or used at the same school.

Any prospective students who think they may be eligible can obtain further information by contacting the State of North Carolina Veterans Service District Office located in the First Union National Bank Building on Front Street in Wilmington.

17. Vocational Rehabilitation.

Vocational Rehabilitation is a program operated through the Division of Vocational Rehabilitation in cooperation with the North Carolina Department of Public Instruction and the Federal Office of the Vocational Rehabilitation Administration. The Division is financed by State and Federal funds. Vocational Rehabilitation offers such services as are necessary to enable a physically or mentally employment-handicapped person to become self-supporting. Financial assistance is available for training at the Cape Fear Technical Institute for eligible handicapped persons.

If a prospective student has a physical disability or is limited in his activity because of a disability, he should contact the Division of Vocational Rehabilitation Office nearest him. The Division Office for Southeastern North Carolina is located at 709 Market Street in Wilmington, N.C.

18. "G. I. Bill" Educational Benefits.

Most of the curriculum (credit) courses offered by CFTI are approved for training under the "G. I. Bill" Title 38, United States Code, most recently amended by the G. I. Bill Improvement Act of 1977, Public Law 95-202.

The educational benefits available under the G. I. Bill are administered by the Veterans Administration which also is the final authority for determining eligibility. These benefits are not only available to eligible veterans, but also the spouses and children of certain categories of living and deceased veterans, and to certain active duty military personnel.

The length of time benefits may be paid and the amount payable is determined by the Veterans Administration based on several factors pertaining to each eligible person and the type of educational program entered.

Veterans and other prospective students eligible for G. I. Bill benefits are admitted to CFTI under the same admission re-

quirements and attend school under the same school policies and regulations as other students. However, the Veterans Administration may impose additional requirements from time to time on the school and/or the students attending under the G. I. Bill which could result in the termination of benefits if not met.

Prospective students who believe they may be eligible for G. I. Bill benefits can obtain full details on the G. I. Bill, assistance in determining eligibility and assistance in the initiation of benefits from any of the following:

1. Veterans Administration Regional Office
   251 North Main St.
   Winston-Salem, N. C. 27102
2. State of North Carolina District Veterans Service Office in Wilmington
   P. O. Box 1742
   First Union National Bank Building
   Wilmington, N. C. 28401
3. Pender County Veterans Service Office
   County Administration Building
   Burgaw, N. C. 28425
4. Brunswick County Veterans Service Office
   P. O. Box 141
   Shallotte, N. C. 28459
5. Veterans Affairs Office
   Room 203
   Cape Fear Technical Institute
   411 N. Front Street
   Wilmington, N. C. 28401

FEDERAL PROGRAMS

The Technical Institute cooperates with various federal agencies which provide financial assistance to occupational education trainees. Full information about such programs, when they are available, may be obtained from the Student Affairs section of the Institute.

THE LIBRARY LEARNING RESOURCE CENTER

The Cape Fear Technical Institute Library Learning Resource Center Reading Room is located at the top—sixth floor—of the new educational tower. Currently there are available, in the open stack collection, some 22,000 items for use in addition to over 200 magazines and newspapers. Microfilm and microfiches of selected back issues are maintained for your reference. The materials include disc and tape recordings, 35mm filmstrips, 35mm slides, overhead transparen-

cies, 8mm single concept film loops, LaBelle cartridges, 16mm sound motion pictures, video tape recordings, sculpture replicas, prints of famous documents and works of art, the still picture idea file, and the major charts and maps collection. Photocopy and interlibrary loan services are also available.

Persons using the materials collections are expected to return borrowed items promptly, pay the late return fines, if applicable, and to assume responsibility for replacing any lost materials. The LLRC Reading Room Services will help patrons with all circulation of materials, reference and reserve materials, college catalogs, career materials/information, interlibrary loan, recreational reading/listening (viewing) and copying services.

The LLRC Audio-Visual Services Department has as its main function, service to CFTI faculty through the production of teaching materials which are not readily available from commercial sources, as well as the maintenance of related audio-visual equipment and materials. This division also maintains, in its closed stack collection, the classroom oriented motion picture films and other media collections. The LLRC Audio-Visual Services Department issues and validates ID cards.

The LLRC houses the Living Museum, and, from time to time, traveling exhibits of art and handicraft, CFTI student workmanship, as well as works of art by area residents are placed on display.

While the activities and materials collections of the LLRC, for the most part, are related to the programs offered by CFTI and exist primarily for the students, faculty, and staff of the Institute, all adult residents of the area served by Cape Fear Technical Institute, and particularly industrial employees have a cordial welcome to the Center.

COUNSELING SERVICES

Qualified counselors are available to assist students in selecting an appropriate course of study, to provide occupational and educational information and to discuss scholastic or personal problems which may arise.

GRADE POINT AVERAGES AND GRADING

Letter grades are used at Cape Fear Technical Institute in reporting grades to students; however, such terms as 3.20, 2.60, and 1.89 will be used. These are called "grade point averages," and are very important. They are earned on the following basis:

GRADE	NUMERICAL EQUIVALENCY	SIGNIFICANCE	QUALITY POINTS PER QUARTER HOUR
A	94-100	Superior	4
B	86-93	Good	3
C	78-85	Average	2
D	70-77	Poor	1
E	Below 70	Failure	0
I	Incomplete	Incomplete	0
WP		Withdrawal	0
WF		Withdrawal Failing	0

Incomplete Grades

Incomplete will be given only when circumstances justify additional time to complete the course. An incomplete must be removed within six weeks following the quarter it was received. Grades not made up within six weeks will be recorded as an "E".

Report cards are mailed to the student shortly after the end of each quarter.

What is a "Quarter Hour Credit"?

Each course listed is followed by a notation on the number of quarter hours it carries. Normally, the number of quarter hours earned is based on the number of class, laboratory or shop hours spent under the supervisor or the course instructor per week for the quarter.

Usually 1 quarter hour credit is given for each hour of class per week, for each two hours of laboratory work per week, or for each three hours of shop or manipulative laboratory per week. (A class hour requires a minimum of 50 minutes of instruction.) Classroom portions require outside preparation, normally 2 hours per each hour of instruction. Exceptions to this arrangement may be made in cases where specific classification is not feasible.

How are Grade-point averages computed?

For example, suppose grades for the Quarter are:

SUBJECT	GRADE	QTR. HOURS CREDIT
T ENG 102	94 or A	3
T MAT 102	87 or B	5
T BUS 120	76 or D	4
T ECO 104	83 or C	3
T BUS 115	78 or C	3
		—
		18

The grade for each subject will be converted to a grade-point (see conversion in table above). Then the grade-point is multiplied by the quarter hours. The result (Total quality points) is then divided by the total quarter hours credit to give the grade-point average.

Example:

CLASS	GRADE POINT		QTR. HOURS CREDIT		QUALITY POINTS
T ENG 102	4	×	3	=	12
T MAT 102	3	×	5	=	15
T BUS 120	1	×	4	=	4
T ECO 104	2	×	3	=	6
T BUS 115	2	×	3	=	6
			—		—
	TOTALS		18		43

Divide 43 ÷ 18 = 2.39
The grade point average is 2.39.

TRANSCRIPT OF RECORDS

Upon request of the student, transcripts of credit earned at Cape Fear Technical Institute only will be sent to other schools and/or industry. There is no charge for this service. Requests should be made to the Registrar's Office.

REQUIREMENTS FOR GRADUATION

To receive the Associate in Applied Science Degree, a student must maintain satisfactory grades in all laboratory and class subjects and an overall grade point average of 2.00.

To receive a diploma, a student must have a satisfactory passing grade in all shop work and related class subjects. A student must be in residence during the last quarter to be eligible for graduation.

GRADUATION WITH HONORS

Those members of the graduating class who have demonstrated outstanding leadership, attitude and ability will be graduated with honors. Recipients of these awards are selected by Lead Instructors in cooperation with appropriate faculty members.

SCHOLASTIC HONORS

Full-time students who have earned a grade point average of 3.00 with no grade lower than "C" will be placed on the Dean's List.

CONDUCT

Students will have but one conduct rule, i.e., to conduct themselves as ladies and gentlemen. This has reference to dress, speech and action. Area or classroom rules will be designated by instructors or supervisors and must be followed by all.

DISRUPTIVE CONDUCT

The State of North Carolina has issued procedures to be followed in cases of disruptive conduct. Cape Fear Technical Institute, being a State Institute, will follow the procedures prescribed at all times.

WEAPONS ON CAMPUS

It shall be unlawful for any person to possess or carry, whether openly or concealed, any weapon on campus. The only exception made to this directive is in the case where training or job requirements of the student or employee requires that such be carried.

ATTENDANCE AND TARDINESS

The nature of the programs for students at Cape Fear Technical Institute is such that it is necessary that students be in regular attendance at all times.

A student may be absent from a class one time for each quarter hour credit of the course, for emergency reasons, without affecting his grade average. A student who accumulates more class absences than quarter hours credit given may be denied credit by the instructor for such course.

Absences of five consecutive days without notification to the instructor or the Student Personnel Office will result in the student being dropped from the class roll. The student may be readmitted only through the Student Personnel Office.

Emergency absences are defined as:

(a) Illness or injury to the student.

(b) Illness or death in the immediate family.

(c) Inclement weather (hurricane, ice, etc.)

In all cases a student is not to receive credit for a course if he is absent over 20% of the time.

Special note to Marine Technology students: Students in the Marine Technology Curriculum are at times involved in cruises on the ship that might take place during a holiday or quarter break during which time students are normally off. When such occurs, students must participate in the cruise.

DRESS

Where special dress or safety devices are required by the Institute, Department of Community College regulations, public law, the student will be expected to conform. Shorts may not be worn to classes within the institute buildings and shoes must be worn at all times in the buildings and on the ships. Students are expected to maintain good personal grooming consistent with the ordinary requirements of industry. Students will be required to have haircuts insuring meeting good sanitation and safety procedures.

PROBATION AND SUSPENSION

A student failing to make or maintain an accumulative grade point average of 1.50 during any quarter will be subject to academic probation for the following quarter. A probationary student who fails to raise his/her accumulative grade point average to 1.50 is subject to academic suspension or placement in a more appropriate program. A suspended student may return after one quarter and take a class load to be determined in conference with the Admissions Counselor. Subsequent suspensions could result in the student not being re-admitted again.

Any student whose conduct becomes unsatisfactory will be placed on probation—any misconduct after a person is placed on probation will result in prompt suspension.

RIGHT OF APPEAL

Any student who is dismissed from school for academic or disciplinary reasons may have his case reviewed by requesting such through the Dean of Student Affairs who in turn will bring his case before the administration. The appeal may be carried to the Board of Trustees at the student's request.

WITHDRAWAL

Students desiring to withdraw from school should contact the office of Student Affairs to obtain the necessary forms and procedures for official withdrawal. A student who fails to withdraw officially will receive a grade of "WF" for each course in which he/she withdraws.

Students who withdraw from a course/s within 21 calendar days from the date classes begin will receive a grade of "W" which will not be computed in the Grade Point Average (GPA). Students that withdraw from a course/s after this period must receive a grade of "WP" or "WF." The WP's will not be computed in the GPA whereas the

WF will be computed as a failing grade.

In cases where former students desire to re-enter the school they must contact the Admissions Office which will review their records and present their application to the admissions committee for approval.

PLACEMENT

The Placement Officer, Student Affairs Staff, and Faculty at Cape Fear Technical Institute make every possible effort to assist students and graduates in securing positions in their chosen fields. Although the Institute cannot guarantee placement, contact is maintained with business and industry concerning employment opportunities for students at Cape Fear Technical Institute.

There is no charge to industry or students for this placement service.

STUDENT ACTIVITIES

Extra-curricular activities are a very important part of the total educational program at Cape Fear Technical Institute.

Among the intercollegiate activities offered are basketball, softball, golf, and tennis.

Intramural activities offered by the school include volleyball, touch football, chess, and table tennis.

The student government is a very active organization at this school. It is the voice of the student body and has paved the way for good lines of communication between the students and the administration.

The student newspaper, student handbook, and school annual are among the publications done by the students. Students interested in any aspect of such publications are encouraged to participate.

Many students attending CFTI donate their time and energies to Institute projects under the guidance of instructors and community leaders by participating in some type of service club. Service clubs available to students are: Chess Club, Dive Club, Future Secretaries Club, and Veterans Club. Monies received from the Student Activities fee help support the activities offered by the Institute.

HEALTH SERVICES

Health Services provided at this school are: (1) First aid and emergency care is available on campus. (2) Individual health counseling is made available. (3) Referrals for illness and injury that cannot be taken care of by individuals concerned are made to community health facilities. In case of illness or injury requiring transportation, the Student Affairs Office should be contacted immediately.

VETERANS SERVICES

This Institute has reaffirmed its commitment to Veterans by the establishment of a full time Veterans Affairs Office. The Veterans Affairs Office is staffed to provide services at times and places convenient to the veterans being served. Veterans attending this school are encouraged to use the services provided by this office.

ALUMNI

Efforts to keep Alumni of the school informed about what is going on are made by bi-annual newletters. Former students are encouraged to become active in alumni activities.

TECHNICAL CURRICULA

TECHNICAL PROGRAMS

Technicians are among the fastest growing occupational groups in the United States. In recent years, the needs of an expanding and increasingly technical economy have greatly intensified the demand not only for engineers and scientists, but also for the technical workers who assist them. Technicians are those workers whose jobs require both knowledge and use of scientific and mathematical theory; specialized education or training in some aspect of technology or science; and who, as a rule, work directly with scientists and engineers. Some jobs held by these technicians are supervisory and require both technical knowledge and the ability to supervise people.

In carrying out their assignment, engineering and science technicians frequently use complex electronic and mechanical instruments, experimental laboratory apparatus, and drafting instruments. These workers engage in virtually every aspect of engineering and scientific work. In research, development, and design work, they conduct experiments or tests; set up, calibrate, and operate instruments; and make calculations. They also assist scientists and engineers in developing experimental equipment and models by making drawings and sketches and frequently do some design work.

Technicians also work in jobs related to production and may aid in the various phases of production operations, such as working out specifications for materials and methods of manufacture, devising tests to insure quality control of products, or making time-and-motion studies (timing and analyzing the worker's movements) designed to improve the efficiency of a particular operation. They may also perform liaison work between engineering and production or other departments.

The Cape Fear Technical Institute provides training in a number of areas which require training beyond the high school but which do not require four years of college preparation. Most of the technical programs are eighteen months in length and are geared to train a person in specific technical areas. Students spend twenty to thirty hours per week in classroom and laboratory work; additional time will be needed for outside assignments.

Credit hours granted in the various technical programs are not transferable to other institutions except as an institution may determine that a particular course and credits are applicable to a curriculum offered by that school.

The associate in applied science degree is awarded to students who complete a technical program. To be eligible for the degree, a student must maintain satisfactory grades in all laboratory and class subjects and an overall grade point average of 2.00.

AUTHORIZED PROGRAMS

Business Administration
Criminal Justice Technology
Drafting & Design Technology
Electronics Technology
General Occupational Technology
General Office Technology
Instrumentation Technology
Manufacturing Process Control Technology (Chemical Technology)
Marine Construction Engineering Technology
Marine Electronics (Special Technology, one quarter only)
Marine Laboratory Technology
Marine Technology
Secretarial—Engineering and Technical

ADMISSION REQUIREMENTS

1. Must be at least eighteen years of age, or his high school class must have graduated.
2. Must be a high school graduate or equivalent.*
3. Must demonstrate aptitude for technician training as determined by standard tests. These tests will aid in student selection, placement, and guidance. Guidance and counseling will be available to the student throughout his education, not just at the time of his enrollment.
4. Must complete medical form provided by Institute.
5. A personal interview is required.
6. Complete Residence Status Form.

ADMISSION PROCEDURE

1. Submit completed application.
2. Have transcripts of all previous education mailed to the Institute.
3. Must take placement test.
4. Come to the school for a personal interview and additional testing when asked to do so.
5. Submit medical form to the Institute.

*See page 178 in General Adult Education Section of this catalogue for details about the high school equivalency certificate.

BUSINESS ADMINISTRATION

In North Carolina the opportunities in business are increasing. With the increasing population and industrial development in this State, business has become more competitive and automated. Better opportunities in business will be filled by students with specialized education beyond the high school level. The Business Administration Curriculum is designed to prepare the student for employment in one of many occupations common to business. Training is aimed at preparing the student in many phases of administrative work that might be encountered in the average business.

The specific objectives of the Business Administration Curriculum are to develop the following competencies:

1. Understanding of the principles of organization and management in business operations.

2. Understanding our economy through study and analysis of the role of production and marketing.

3. Knowledge in specific elements of accounting, finance, and business law.

4. Understanding and skill in effective communication for business.

5. Knowledge of human relations as they apply to successful business operations in a rapidly expanding economy.

The graduate of the Business Administration Curriculum may enter a variety of career opportunities from beginning sales person or office clerk to manager trainee. The duties and responsibilities of this graduate vary in different firms. These encompassments might include: making up and filing reports, tabulating and posting data in various books, sending out bills, checking calculations, adjusting complaints, operating various office machines, and assisting managers in supervising. Positions are available in businesses such as advertising; banking; credit; finance; retailing; wholesaling; hotel, tourist and travel industry; insurance; transportation; and communications.

BUSINESS ADMINISTRATION

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101-C—Grammar and Composition	3	2	0	4
T-BUS	102—Typewriting	2	0	3	3
T-MAT	110—Business Mathematics	5	0	0	5
T-BUS	101—Introduction to Business	5	0	0	5
T-ECO	102—Economics	3	0	0	3
		18	2	3	20
SECOND QUARTER					
T-ENG	102-C—Grammar and Composition	3	2	0	4
T-BUS	120—Accounting	5	2	0	6
T-ECO	104—Economics	3	0	0	3
T-BUS	103—Typewriting	2	0	3	3
T-MAT	130—Advanced Business Mathematics	5	0	0	5
		18	4	3	21
THIRD QUARTER					
T-ENG	104-Reading and Composition	3	0	0	3
T-BUS	110-C—Office Machines	1	2	0	2
T-BUS	121—Accounting	5	2	0	6
T-BUS	115-C—Business Law	5	0	0	5
T-BUS	104—Typewriting	2	0	3	3
		16	4	3	19
FOURTH QUARTER					
T-ENG	204—Oral Communication	3	0	0	3
T-EDP	104-C—Data Processing Theory	3	2	0	4
T-BUS	122—Accounting	5	2	0	6
T-PSY	206-C—Applied Psychology	3	0	0	3
		14	4	0	16
FIFTH QUARTER					
T-ENG	206—Business Communication	3	0	0	3
T-BUS	123-C—Business Finance	3	2	0	4
T-BUS	229—Taxes	3	2	0	4
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-BUS	239—Marketing	5	0	0	5
		17	4	0	19
SIXTH QUARTER					
T-BUS	124-C—Business Finance	3	2	0	4
T-BUS	220-C—Managerial Accounting	5	2	0	6
T-BUS	235-C—Business Management	3	2	0	4
T-SOC	206-C—American Institutions	3	0	0	3
T-BUS	232-C—Sales Development	3	0	0	3
		17	6	0	20

See pages 80 to 120 for Course Descriptions.

CRIMINAL JUSTICE TECHNOLOGY

The Criminal Justice Program at Cape Fear Technical Institute is designed to prepare the student in the legal, philosophical, technical, and practical aspects of law enforcement. Specific objectives of the curriculum are to develop competency in the following areas: understanding of the principles and applications of criminal law; the psychology of human behavior; the sociology of social problems; the understanding of law enforcement in the community; the development of skills in oral and written communications; and an understanding of human relations as successfully employed in criminal justice.

The Criminal Justice curriculum requires seven (7) quarters (two years) of full-time study for completion. It may be taken on a part-time basis over a longer period of time.

The Criminal Justice Career offers its personnel an opportunity to contribute to the safety and welfare of our society. The graduate of the Criminal Justice Curriculum has a variety of career opportunities available. A person may be employed by one of the federal, state, county, or municipal law enforcement agencies as a police officer, criminal investigator, supervisor, administrator, or a specialist in traffic control, identification, criminalistics, or community relations, and in special investigative fields such as alcoholic beverage control, wildlife and game preservation, and forestry control. The graduate also has opportunities for employment in private security, in the corrections or juvenile detention field, and in other social services.

In addition to the general admission requirements for all technical students, those enrolling in the Criminal Justice (Police Science) curriculum must (1) be a United States citizen; (2) be fingerprinted; (3) not have been convicted of a felony, an offense of moral turpitude, or a crime which is punishable by imprisonment for more than two (2) years and, (4) have a personal interview with the department chairman.

CRIMINAL JUSTICE TECHNOLOGY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-CJC	101—Introduction to Criminal Justice	3	0	0	3
T-CJC	102—Introduction to Criminology	3	0	0	3
T-CJC	112—Criminal Justice Seminar	1	0	3	2
T-ENG	101—Grammar	3	0	0	3
T-MAT	121—Technical Mathematics	5	0	0	5
		15	0	3	16
SECOND QUARTER					
T-CJC	110—Law Enforcement Role in Crime & Delinquency	3	0	0	3
T-CJC	104—Patrol Procedure & Traffic Law Enforcement	2	0	0	2
T-CJC	103—Introduction to Criminal Investigation	3	0	0	3
T-ENG	102—Composition	3	0	0	3
T-BUS	102—Typewriting	2	0	3	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
		16	0	3	17
THIRD QUARTER					
T-CJC	210—Criminal Investigation	3	0	0	3
T-CJC	115—Criminal Law	3	0	0	3
T-CJC	203—Forensic Photography	4	0	0	4
T-ENG	103—Report Writing	3	0	0	3
T-SOC	206-C—American Institutions	3	0	0	3
T-MAT	211—Technical Mathematics	5	0	0	5
		21	0	0	21
FOURTH QUARTER					
T-CJC	299—Research Seminar	3	0	3	4
T-CJC	105—Firearms	0	0	6	2
T-CJC	106—Teaching Methods	3	0	0	3
T-ENG	204—Oral Communications	3	0	0	3
T-SOC	212—Sociology of Deviant Behavior	3	0	0	3
T-MAT	211—Basic Statistics	5	0	0	5
		17	0	9	20
FIFTH QUARTER					
T-CJC	211—Introduction to Criminalistics	3	2	0	4
T-CJC	221—Law Enforcement Supervision	3	0	0	3
T-EDP	201—Introduction to Computer Programming	2	0	3	3
T-CHM	101—Introduction to Chemistry	3	2	0	4
	—(School Elective)	3	0	0	3
		14	4	3	17

		HOURS PER WEEK			
SIXTH QUARTER		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-CJC	205—Scientific Evidence	3	0	0	3
T-CJC	220—Law Enforcement Organization & Management	3	0	0	3
T-PHY	225—Forensic Physics	3	2	0	4
T-PSY	209—Applied Psychology for Law Enforcement	3	0	0	3
	—(Criminal Justice Elective)	3	0	0	3
		15	2	0	16
SEVENTH QUARTER					
T-CJC	222—Crime Scene Investigation	3	0	0	3
T-CJC	224—Industrial Security	3	0	0	3
T-POL	103—Government	3	0	0	3
T-HED	121—Emergency Medical Technician	5	0	4	5
T-PSY	228—Abnormal Psychology	3	0	0	3
	—(Criminal Justice Elective)	3	0	0	3
		20	0	4	20
CRIMINAL JUSTICE ELECTIVES					
T-CJC	213—Juvenile Justice Administration	3	0	0	3
T-CJC	125—Due Process Court Structure & Procedure	3	0	0	3
T-CJC	212—Narcotics Investigation	5	0	0	5
T-POL	105—Constitutional Law I	3	0	0	3

See Pages 80 to 120 for Course Descriptions.

DRAFTING & DESIGN — MECHANICAL

There are certain identifiable duties which are common to all Drafting and Design technicians. This curriculum has been designed to train persons in the accepted performance of these basic duties that will be assigned, and to enable the individual student to become proficient in a short time after he becomes employed in the industry.

Courses in general education have been included to give a student the assurance and understanding that come with education upon a broad base. The technician associates with many levels of thought and expression — administrative, personnel, scientists, engineers, skilled workmen — and must be able to communicate effectively with all levels. Courses containing essential information from related subject areas, such as mathematics, physics, and mechanics, have been included in order to provide the student a better academic base for his training. Emphasis is placed upon ability to think and plan, as well as drafting procedures and techniques.

Mechanical drafting and design technicians are concerned with the preparation of drawings for design proposals, for experimental models and items for production.

These technicians perform many aspects of drafting in a specialized field, such as the developing of the drawing of a section, subassembly or major component. Investigating design factors and availability of material and equipment, production methods and facilities are frequent assignments. They assist in the design of existing units and reports on functional performance. They may draw components in industrial fields based on engineers' original design concepts or specific ideas. Also, they may be assigned as coordinator for the execution of related work or other design, production, tooling, material and planning groups. Technicians with experience in this classification may often supervise the preparation of working drawings.

These technicians are employed in many types of manufacturing, fabrication, research, development, and service industries. Substantial numbers also are employed in communications, transportation, public utilities, consulting engineering firms, and federal, state, and local governments.

DRAFTING & DESIGN — MECHANICAL

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101—Grammar	3	0	0	3
T-MAT	121—Technical Mathematics	5	0	0	5
T-DFT	101-C—Technical Drafting	3	0	9	6
T-PSY	206-C—Applied Psychology	3	0	0	3
		14	0	9	17
SECOND QUARTER					
T-ENG	102—Composition	3	0	0	3
T-MAT	122—Technical Mathematics	5	0	0	5
T-DFT	102-C—Technical Drafting	0	0	9	3
T-BUS	102—Typewriting	2	0	3	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
		13	0	12	17
THIRD QUARTER					
T-ENG	103—Report Writing	3	0	0	3
T-MAT	123—Technical Mathematics	5	0	0	5
T-PHY	102-C—Introductory Physics	4	2	0	5
T-DFT	103-C—Technical Drafting	2	0	6	4
T-SOC	206-C—American Institutions	3	0	0	3
		17	2	6	20
FOURTH QUARTER					
T-ENG	204—Oral Communication	3	0	0	3
T-DFT	208—Introduction to Architectural Drafting	3	0	6	5
T-PHY	103—Physics: Electricity	3	2	0	4
T-MEC	216—Industrial Materials	5	0	0	5
T-MEC	101—Machine Processes	0	4	0	2
		14	6	6	19
FIFTH QUARTER					
T-DFT	201—Technical Drafting	3	0	6	5
T-PHY	106—Applied Mechanics	3	2	0	4
T-MEC	209-C—Introduction to Metallurgy	3	2	0	4
T-WLD	101—Welding	0	0	3	1
T-MEC	102—Machine Processes	0	4	0	2
		9	8	9	16
SIXTH QUARTER					
T-DFT	206—Design Drafting	4	0	9	7
T-MEC	235-C—Hydraulics and Pneumatics	3	0	3	4
T-DFT	211—Mechanism	3	2	0	4
T-MEC	205—Strength of Materials	2	0	0	2
		12	2	12	17

See pages 80 to 120 for Course Descriptions.

ELECTRONICS TECHNOLOGY

The field of electronics has developed at a rapid pace since the turn of the century. For many years the major concern of electronics was in the area of communications. Developments during World War II and in the period since have revolutionized production techniques. New industries have been established to supplement the need and demand for electronics equipment.

Many opportunities exist for men and women with a technical education in electronics. This curriculum provides a basic background in electronic related theory with practical applications of electronics for business and industry. Courses are designed to develop competent electronics technicians who may take their place as an assistant to an engineer, or as a liaison between the engineer and the skilled craftsman.

The electronics technician may start in one or more of the following areas: research, design, development, production, maintenance or sales. He may be an assistant to an engineer, an engineering aide, laboratory technician, supervisor or equipment specialist. His training is similar to that of an engineer, but in less depth and more practical in application.

ELECTRONICS TECHNOLOGY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101—Grammar	3	0	0	3
T-MAT	121—Technical Mathematics	5	0	0	5
T-MAT	111—Applied Mathematics for Electronics	5	0	0	5
T-ELC	107-C—Electricity I	5	0	3	6
T-ELN	106—Electronics I (Instrument Familiarization)	2	0	6	4
		20	0	9	23
SECOND QUARTER					
T-ENG	102—Composition	3	0	0	3
T-MAT	122—Technical Mathematics	5	0	0	5
T-MAT	122—Applied Mathematics for Electronics	3	0	0	3
T-ELC	108—Electricity II	4	0	3	5
T-ELN	107—Electronics II (Semiconductor Diodes)	5	0	6	7
		20	0	9	23
THIRD QUARTER					
T-ENG	103—Report Writing	3	0	0	3
T-MAT	123—Technical Mathematics	5	0	0	5
T-MAT	113—Applied Mathematics for Electronics	3	0	0	3
T-ELC	109—Electricity III	4	0	3	5
T-ELN	108—Electronics III (Transistors)	3	0	3	4
T-EDP	201—Introduction to Computer Programming	2	0	3	3
		20	0	9	23
FOURTH QUARTER					
T-ELN	109—Electronics IV	3	0	6	5
T-ELN	110—Electronic and Instrumentation Laboratory Practices	1	0	3	2
T-MAT	114—Applied Mathematics for Electronics	3	0	0	3
T-ELC	110—Electronic and Instrumentation Schematic Reading	1	0	3	2
T-DFT	101—Technical Drafting	1	0	3	2
T-PHY	102-C—Introductory Physics	4	2	0	5
		13	2	15	19
FIFTH QUARTER					
T-ELN	205—Applications of Vacuum Tubes and Transistors	4	0	3	5
T-PSY	206-C—Applied Psychology	3	0	0	3
T-ELN	213—Pulse Circuit Analysis	2	0	3	3
T-ELN	229—Electronic Project	2	0	3	3
T-ELN	232—F.C.C. License Preparation I	4	0	0	4
		15	0	9	18

See pages 80 to 120 for Course Descriptions.

		HOURS PER WEEK			
SIXTH QUARTER		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-ENG	204—Oral Communication	3	0	0	3
T-ELN	230—Electronic Project	3	0	3	4
T-ELN	238—Antenna and Transmission Line Theory	2	2	0	3
T-ELN	241—Digital Principles and Applications	4	0	6	6
		15	2	9	19
SEVENTH QUARTER					
T-SOC	206-C—American Institutions	3	0	0	3
T-ELN	220—Electronic Systems	6	0	0	6
T-ELN	231—Electronic Project	2	0	6	4
T-ELN	233—F.C.C. License Preparation II	6	0	0	6
T-BUS	272—Principles of Supervision	3	0	0	3
T-ELN	236—Electronics-Instrumentation Field Trips	0	0	3	1
		20	0	9	23

See pages 80 to 120 for Course Descriptions.

GENERAL OCCUPATIONAL TECHNOLOGY

This curriculum is designed to provide adults with an opportunity to earn an Associate in Applied Science Degree by taking occupationally oriented courses either from the regular curriculum offerings of the Institute during the daytime, or from single credit earning courses offered at night. The curriculum is of particular value to individuals who are employed and need technical training for upgrading skills needed for their present jobs, or preparation for moving to higher levels of employment.

A total of 112 quarter hours of curriculum credit must be completed to earn the Associate Degree. All students will take a course of general education consisting of 12 quarter hours credit in English, 15 quarter hours in mathematics, 12 quarter hours in physics, and 9 quarter hours in social science. The remaining 64 quarter hours of credit may be selected by the student from technical courses listed in the Institute's catalog and/or from individual credit earning curriculum courses approved by the Institute's curriculum committee. While not required, it is expected that individuals will consult the Student Services Division of the Institute and their employers when selecting the occupationally oriented courses to complete their degree program.

Credit for previous education and experience (through qualifying examinations) will be granted students in this curriculum under the same provisions as for other curricula offered by the Institute. Prerequisites for all courses must be satisfied.

GENERAL OCCUPATIONAL TECHNOLOGY

REQUIRED COURSES

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-ENG	101—Grammar	3	0	0	3
T-ENG	102—Composition	3	0	0	3
T-ENG	103—Report Writing	3	0	0	3
T-ENG	204—Oral Communication	3	0	0	3
T-MAT	121—Technical Mathematics	5	0	0	5
T-MAT	122—Technical Mathematics	5	0	0	5
T-MAT	123—Technical Mathematics	5	0	0	5
T-PHY	101—Physics: Properties of Matter	3	2	0	4
T-PHY	102—Physics: Work, Energy and Power	3	2	0	4
T-PHY	103—Physics: Electricity	3	2	0	4
or					
T-PHY	104-C—Physics: Light and Sound	3	2	0	4
T-PSY	206-C—Applied Psychology	3	0	0	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-SOC	206-C—American Institutions	3	0	0	3

ELECTIVE COURSES

64 quarter hours credit to be taken from credit earning industrially oriented technical courses carried in the Institute's catalog and/or individual credit earning technical courses approved by the curriculum committee. See list below:

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-AHR	101—Fundamentals of Refrigeration I	4	0	3	5
T-AHR	102—Fundamentals of Refrigeration II	3	0	6	5
T-ARC	101—Architectural Graphics I	3	0	6	5
T-ARC	102—Architectural Graphics II	3	0	6	5
T-ARC	103—Architectural Graphics III	3	0	6	5
T-ARC	121—Architectural Materials and Methods I	3	0	3	4
T-ARC	135—Codes, Contract Documents and Specifications	3	0	3	4
T-ARC	201—Architectural Graphics IV	2	0	9	5
T-ART	100-C—Elements of Commercial Art	2	0	3	3
T-BIO	101—Human Anatomy and Physiology I	4	2	0	5
T-BIO	107—Human Anatomy and Physiology II	4	2	0	5
T-BIO	108—Human Anatomy and Physiology III	4	2	0	5
T-BIO	115—Medical Terminology and Vocabulary I	3	0	0	3
T-BIO	116—Medical Terminology and Vocabulary II	3	0	0	3
T-CAT	106-C—Figure Drawing	1	0	3	2
T-CAT	121-C—Basic Drawing	1	0	3	2
T-CAT	137-C—Specialty Drawing	1	0	3	2
T-CAT	201-C—Typography and Lettering	1	0	3	2
T-CAT	204-C—Advertising Copy	1	0	3	2
T-CAT	206-C—Brochure Design	1	0	3	2
T-CIV	201—Properties of Engineering Materials	2	0	3	3
T-CIV	216—Strength of Materials	3	2	0	4
T-CIV	217—Construction Planning, Equipment and Methods	3	2	0	4
T-CIV	218—Plain Concrete	3	0	3	4

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-CIV	223—Codes, Contracts and Specifications	2	0	0	2
T-DFT	106—Architectural Drafting	2	0	6	4
T-DFT	107—Architectural Drafting	2	4	0	4
T-DFT	108—Architectural Drafting	0	0	9	3
T-DFT	110—Technical Sketching	1	0	3	2
T-DFT	112—Electronic Drafting	2	0	3	3
T-DFT	118—Drafting and Blueprint Interpretation	0	0	6	2
T-DFT	220—Architectural Drafting	2	0	6	4
T-DFT	221—Architectural Drafting	2	0	9	5
T-DFT	222—Architectural Drafting	2	0	9	5
T-DFT	230—Structural Drafting	2	0	6	4
T-DFT	231—Architectural Mechanical Equipment Drafting	2	0	6	4
T-DFT	233—Architectural Office Practice Seminar	2	0	0	2
T-DFT	235—Codes, Specifications and Contract Documents	3	0	3	4
T-DFT	236—Construction Estimating and Field Inspection	3	0	3	4
T-ECO	108—Consumer Economics	3	0	0	3
T-EDP	201—Introduction to Computer Programming	2	0	3	3
T-EDP	211—Advanced Programming	2	2	0	3
T-EGY	101—Introduction to Energy Resources	3	0	0	3
T-EGY	102—Introduction to Solar Energy Systems (Thermal)	4	2	0	5
T-EGY	103—Introduction to Solar Energy Systems (Electrical)	4	2	0	5
T-ELC	112—Industrial Electricity I	2	3	0	4
T-ELC	113—Industrial Electricity II	2	2	0	3
T-ELC	202—Industrial Electricity III	2	2	0	3
T-ELC	203—Industrial Electricity IV	2	2	0	3
T-ELC	204—Industrial Electricity V	0	4	0	2
T-ELN	111—Industrial Instrumentation I	1	2	0	2
T-ELN	112—Industrial Instrumentation II	2	2	0	3
T-ELN	206—Industrial Instrumentation III	2	2	0	3
T-ELN	207—Industrial Instrumentation IV	2	2	0	3
T-ELN	208—Industrial Instrumentation	2	2	0	3
T-FIP	110—General Insurance	3	0	0	3
T-FIP	201—Individual Life Insurance	3	0	0	3
T-FIP	247—Business Insurance	3	0	0	3
T-HEA	109—Medical Ethics, Law, and Economics	3	0	0	3
T-HEA	110—Clinical Practice	3	0	0	3
T-INS	201—Economic Security and Individual Life Insurance	3	0	0	3
T-ISC	113—Industrial Safety	1	0	0	1
T-ISC	120—Principles of Industrial Management	5	0	0	5
T-ISC	210—Job Analysis and Evaluation	3	2	0	4
T-ISC	211—Work Measurement	3	2	0	4
T-ISC	268—Purchasing and Materials Management	3	0	0	3
T-ISC	302—Quality Control	3	0	3	4
T-MAT	101—Technical Mathematics	5	0	0	5
T-MAT	102—Technical Mathematics	5	0	0	5
T-MAT	103—Technical Mathematics	5	0	0	5

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-MAT	201—Technical Mathematics	5	0	0	5
T-MAT	208—Precalculus Mathematics	5	0	0	5
T-MAT	209—Introduction to Calculus	5	0	0	5
T-MAT	215—Fundamentals of Conversion to Metric System	5	0	0	5
T-MAT	221—Technical Mathematics	5	0	0	5
T-MEC	111—Industrial Mechanics I	5	2	0	6
T-MEC	112—Industrial Mechanics II	3	2	0	4
T-MEC	113—Industrial Mechanics III	2	0	0	2
T-MEC	115—Industrial Pipefitting I	1	2	0	2
T-MEC	116—Industrial Pipefitting II	4	2	0	5
T-MEC	218—Industrial Pipefitting III	2	4	0	4
T-MEC	219—Industrial Equipment Maintenance I	2	6	0	5
T-MEC	220—Industrial Equipment Maintenance II	0	2	0	1
T-MEC	221—Industrial Equipment Maintenance III	4	4	0	6
T-MEC	240—Radiographic Testing	3	0	0	3
T-MEC	244—Liquid Penetrant Method	2	2	0	3
T-MEC	247—Magnetic Particle Testing	2	2	0	3
T-MEC	248—Ultrasonic Testing	2	2	0	3
T-MET	101—Introduction to Meteorology	3	0	0	3
T-MGT	104—The Art of Motivating People	2	0	0	2
T-MSC	218—Eddy Current Testing	3	2	0	4
T-REA	101—Fundamentals of Real Estate	6	0	0	6
T-REA	209—Real Estate Finance	5	0	0	5
T-REA	221—Real Estate Investment and Taxation	3	0	0	3
T-REA	292—Real Estate Appraisal I	3	0	0	3
T-REA	293—Real Estate Appraisal II	2	3	0	4
T-REA	296—Property Management	3	0	0	3

See pages 80 to 120 for Course Descriptions.

GENERAL OFFICE TECHNOLOGY

More people are now employed in clerical occupations than in any other single job category. Automation and increased production will mean that these people will need more technical skills and a greater adaptability for diversified types of jobs.

The General Office Occupations curriculum is designed to develop the necessary variety of skills for employment in the business world. Specialized training in skill areas is supplemented by related courses in mathematics, accounting, business law, and applied psychology.

The graduate of the General Office Technology curriculum may be employed as an administrative assistant, accounting clerk, assistant office manager, bookkeeper, file clerk, or a variety of other clerical-related jobs. Positions are available in almost every type of business, large or small.

GENERAL OFFICE TECHNOLOGY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101-C—Grammar and Composition	3	2	0	4
T-BUS	102—Typewriting	2	0	3	3
T-MAT	110—Business Mathematics	5	0	0	5
T-ECO	102—Economics	3	0	0	3
T-BUS	115-C—Business Law	5	0	0	5
		18	2	3	20
SECOND QUARTER					
T-ENG	102-C—Grammar and Composition	3	2	0	4
T-BUS	103—Typewriting	2	0	3	3
T-BUS	120—Accounting	5	2	0	6
T-ECO	104—Economics	3	0	0	3
T-MAT	130—Advanced Business Mathematics	5	0	0	5
		18	4	3	21
THIRD QUARTER					
T-ENG	104—Reading and Composition	3	0	0	3
T-BUS	104—Typewriting	2	0	3	3
T-BUS	121—Accounting	5	2	0	6
T-BUS	183—Terminology and Vocabulary	3	0	0	3
T-BUS	110-C—Office Machines	1	2	0	2
		14	4	3	17
FOURTH QUARTER					
T-BUS	205—Advanced Typewriting	2	0	3	3
T-EDP	104-C—Data Processing Theory	3	2	0	4
T-PSY	206-C—Applied Psychology	3	0	0	3
T-ENG	204—Oral Communication	3	0	0	3
T-BUS	122—Accounting	5	2	0	6
		16	4	3	19
FIFTH QUARTER					
T-BUS	213-C—Office Procedures	1	2	0	2
T-BUS	212—Machine Transcription	1	2	0	2
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-BUS	209—Advanced Typewriting	2	0	3	3
T-ENG	206—Business Communication	3	0	0	3
T-BUS	239—Marketing	5	0	0	5
		15	4	3	18
SIXTH QUARTER					
T-BUS	112—Filing	3	0	0	3
T-BUS	210—Advanced Typewriting	2	0	3	3
T-BUS	235-C—Business Management	3	2	0	4
T-SOC	206-C—American Institutions	3	0	0	3
T-BUS	232-C—Sales Development	3	0	0	3
		14	2	3	16

ee pages 80 to 120 for Course Descriptions.

INSTRUMENTATION TECHNOLOGY

Measuring and controlling instruments are now in such widespread use in our modern world that we take them for granted.

The progress of industry depends on precise, effective, and diversified instruments. The Instrumentation Technician has a tremendous responsibility to both production and production control in all industries.

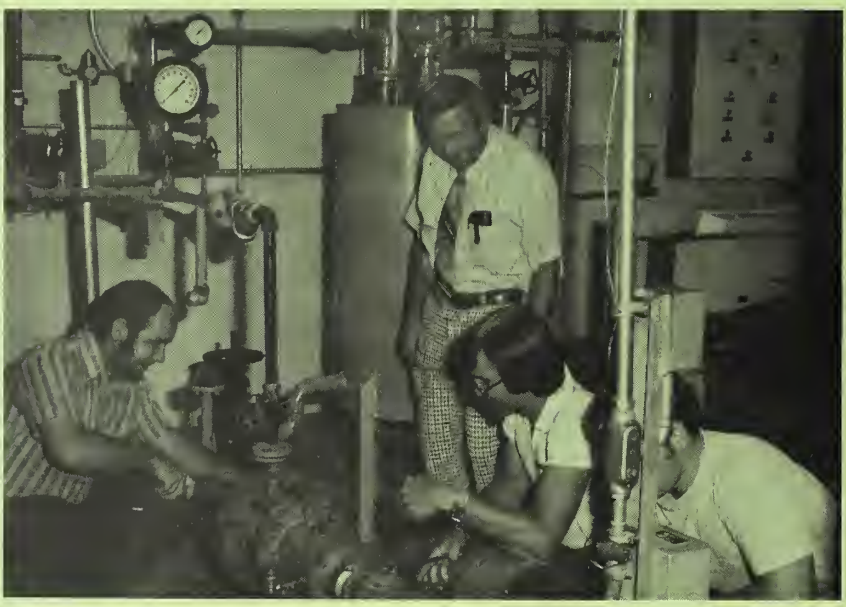
Instruments are used for measurement and control of industrial manufacturing, conversion, or treating processes. An Instrumentation Technician must deal with variables that affect properties such as temperature, pressure, flow, level, humidity, density, viscosity, etc. In short, instrumentation men are key personnel to keeping a manufacturing firm running. Should any major piece of equipment break down usually it remains out of operation until such time as the instrumentation man can make necessary repairs of adjustments. The Instrument Technician in most manufacturing plants works with or assists engineers in their work; therefore, training is similar to that of the engineer.

INSTRUMENTATION TECHNOLOGY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101—Grammar	3	0	0	3
T-MAT	121—Technical Mathematics	5	0	0	5
T-MAT	111—Applied Mathematics for Electronics	5	0	0	5
T-ELC	107—Electricity I	5	0	3	6
T-ELN	106—Electronics I (Instrument Familiarization)	2	0	6	4
		20	0	9	23
SECOND QUARTER					
T-ENG	102—Composition	3	0	0	3
T-MAT	122—Technical Mathematics	5	0	0	5
T-MAT	112—Applied Mathematics for Electronics	3	0	0	3
T-ELC	108—Electricity II	4	0	3	5
T-ELN	107—Electronics II (Semiconductor Diodes)	5	0	6	7
		20	0	9	23
THIRD QUARTER					
T-ENG	103—Report Writing	3	0	0	3
T-MAT	123—Technical Mathematics	5	0	0	5
T-MAT	113—Applied Mathematics for Electronics	3	0	0	3
T-ELC	109—Electricity III	4	0	3	5
T-ELN	108—Electronics III (Transistors)	3	0	3	4
T-EDP	201—Introduction to Computer Programming	2	0	3	3
		20	0	9	23
FOURTH QUARTER					
T-ELN	109—Electronics IV	3	0	6	5
T-ELN	110—Electronic and Instrumentation Laboratory Practices	1	0	3	2
T-MAT	114—Applied Mathematics for Electronics	3	0	0	3
T-ELC	110—Electronic and Instrumentation Schematic Reading	1	0	3	2
T-DFT	101—Technical Drafting	1	0	3	2
T-PHY	102-C—Introductory Physics	4	2	0	5
		13	2	15	19
FIFTH QUARTER					
T-ELN	241-C—Digital Principles and Applications	2	0	3	3
T-ELN	224—Measurement and Control I	5	0	12	9
T-PHY	105—Heat and Fluids	3	2	0	4
T-PSY	206-C—Applied Psychology	3	0	0	3
		13	2	15	19
SIXTH QUARTER					
T-ELN	225—Measurement and Control II	2	0	12	6
T-CHM	115-C—Instrumentation Chemistry	5	0	3	6
T-PHY	104-C—Physics: Light and Sound	3	2	0	4
T-SOC	102-C—Principles of Sociology	3	0	0	3
		13	2	15	19

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
SEVENTH QUARTER					
T-ELN	226-C—Measurement and Control III	5	0	15	10
T-ELN	236—Electronics-Instrumentation Field Trips	0	0	3	1
T-BUS	272—Principles of Supervision	3	0	0	3
T-SOC	206-C—American Institutions	3	0	0	3
		11	0	18	17

See pages 80 to 120 for Course Descriptions.



MANUFACTURING PROCESSES CONTROL TECHNOLOGY

(Chemical Technology)

This curriculum has been designed to train the student to have sufficient proficiency in understanding basic chemical manufacturing processes and industrial laboratory techniques to find employment in the chemical field as a technician working under the direction of a Chemist or a Chemical Engineer.

Special emphasis is placed on sources of pollution and the chemical and mechanical methods that are used to clean up air and water pollution from manufacturing operations.

MANUFACTURING PROCESSES CONTROL TECHNOLOGY
(Chemical Technology)

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-CHM	114—Basic Chemical Concepts	5	6	0	8
T-PHY	102-C—Introductory Physics	4	2	0	5
T-MAT	121—Technical Mathematics	5	0	0	5
T-ENG	101—Grammar	3	0	0	3
		17	8	0	21
SECOND QUARTER					
T-CHM	115—Industrial Chemistry	5	6	0	8
T-PHY	105—Physics: Heat and Fluids	3	2	0	4
T-MAT	122—Technical Mathematics	5	0	0	5
T-ENG	102—Composition	3	0	0	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
		19	8	0	23
THIRD QUARTER					
T-CHM	116—Industrial Chemistry	5	6	0	8
T-CHM	150—Industrial Operations	3	0	0	3
T-MAT	107—Industrial Calculations	3	0	0	3
T-ENG	103—Report Writing	3	0	0	3
T-PHY	103—Physics, Electricity	3	2	0	4
		17	8	0	21
FOURTH QUARTER					
T-CHM	117-C—Unit Processes	0	20	0	10
T-CHM	151—Industrial Operations	3	0	0	3
T-ENG	204—Oral Communication	3	0	0	3
T-CHM	180—Water Technology	3	0	0	3
		9	20	0	19
FIFTH QUARTER					
T-CHM	243—Industrial Analysis	1	10	0	6
T-CHM	230—Organic Chemistry	3	6	0	6
T-MEC	107—Process Instrumentation	3	0	0	3
T-PSY	206-C—Applied Psychology	3	0	0	3
		10	16	0	18
SIXTH QUARTER					
T-CHM	244—Industrial Analysis	1	10	0	6
T-CHM	231-C—Organic Chemistry	3	6	0	6
T-MEC	215—Metallurgy	3	2	0	4
T-MEC	108—Process Instrumentation	3	0	3	4
		10	18	3	20
SEVENTH QUARTER					
T-CHM	245—Industrial Analysis	1	10	0	6
T-CHM	232-C—Organic Chemistry	3	6	0	6
T-MEC	235-C—Hydraulics and Pneumatics	3	0	3	4
T-SOC	206-C—American Institutions	3	0	0	3
		10	16	3	19

See pages 80 to 120 for Course Descriptions.

UNDER REVISION

MARINE CONSTRUCTION ENGINEERING TECHNOLOGY

With the growing importance of marine study and development, the construction industry is finding an increasing need to adapt building principles and practices to the water. The Marine Construction Program, a two-year course, emphasizes the basics of construction adapted to application on rivers, sounds, coasts, and oceans. Some of the basic principles and practices include planning, estimating and use of building materials, blueprints interpretation, use and maintenance of machinery, underwater welding, basic surveying, and navigation.

Students may participate in various construction projects and/or field trips which will be determined according to need and availability of local agencies. These projects may include bulkheads, sea walls, jetties, pier and dock facilities.

Graduates of this program will be trained to serve as technical support personnel or as liaison between the skilled workers, the contractor, or the engineer-architect, qualifying for such jobs as: Engineering Liaison, Building-Construction Inspector, Surveyor Helper, Maintenance Technician, Engineer Inspector, and others.

MARINE CONSTRUCTION ENGINEERING TECHNOLOGY

		HOURS PER WEEK			
FIRST QUARTER		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-MAT	121—Technical Mathematics	5	0	0	5
T-WLD	134-C—Marine Welding	0	0	3	1
T-MSC	139-C—Introduction to Marine Construction	2	0	3	3
T-MSC	140—Marine Construction Equipment I	3	0	3	4
T-ENG	101—Grammar	3	0	0	3
T-MSC	150—Marine Equipment Operation I	1	0	6	3
		14	0	15	19
SECOND QUARTER					
T-DFT	117—Drafting and Blueprint Reading	3	0	3	4
T-MAT	122—Technical Mathematics	5	0	0	5
T-WLD	135—Marine Welding I	0	0	3	1
T-MSC	141—Marine Construction Equipment II	1	0	3	2
T-ENG	102—Composition	3	0	0	3
T-MSC	151—Marine Equipment Operation II	1	0	6	3
		13	0	15	18
THIRD QUARTER					
T-ENG	103—Report Writing	3	0	0	3
T-MAT	123—Technical Mathematics	5	0	0	5
T-ELC	107—Electricity I	4	2	0	5
T-MSC	152—Marine Equipment Operation III	1	0	6	3
T-MSC	106—Basic Navigation	2	2	0	3
T-WLD	136—Marine Welding II, Underwater Cutting and Welding (Optional)*	0	0	(3)	(1)
		15	4	6	19

*This course is optional because those taking it must be certified scuba divers. Scuba diving is offered to CFTI students by an outside agency during the first or second quarter of the school year. Cost of this course must be borne by the student as it is not included in the school's tuition charge.

FOURTH QUARTER

T-MSC 147—Work Practice

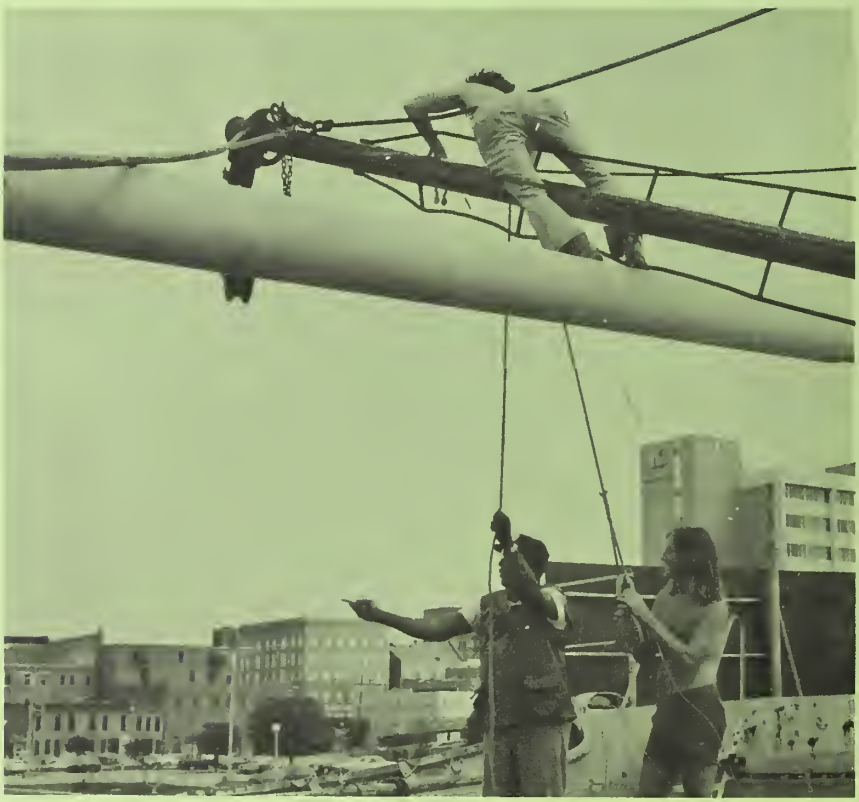
(When evidence is presented to the Director of the Engineering Division that jobs are not available, this course shall be waived.)

FIFTH QUARTER					
T-PSY	206-C—Applied Psychology	3	0	0	3
T-PHY	102-C—Introductory Physics	4	2	0	5
T-CIV	101—Surveying I	2	0	6	4
T-MEC	205—Strength of Materials	2	0	0	2
T-MSC	153—Marine Equipment Operation IV	0	0	6	2
T-MSC	100-C—Small Boat Handling	0	0	3	1
		11	2	15	17

UNDER REVISION

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
SIXTH QUARTER					
T-ENG	204—Oral Communication	3	0	0	3
T-PHY	105—Heat and Fluids	3	2	0	4
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-DFT	213—Marine Construction Drafting	2	0	6	4
T-MSC	154—Marine Equipment Operation V	0	0	3	1
T-MEC	216—Industrial Materials	5	0	0	5
		16	2	9	20
SEVENTH QUARTER					
T-PHY	106—Applied Mechanics	3	2	0	4
T-SOC	206-C—American Institutions	3	0	0	3
T-MSC	148—Marine Construction Engineering Management	3	0	0	3
T-MSC	149—Marine Construction Techniques	3	0	9	6
T-MSC	155—Marine Equipment Operation VI	0	0	3	1
		12	2	12	17

See pages 80 to 120 for Course Descriptions.



MARINE ELECTRONICS

PURPOSE:

Research vessels, fishing fleets and pleasure craft have become highly dependent on electronic equipment in order to perform and successfully complete assigned missions and tasks. This dependency is increasing daily and shall continue to do so, since the need for concise, accurate and specific data concerning the ocean, navigation and communications is increasing as rapidly as the population.

Electronic industries concerned with marine instrumentation are constantly striving to produce more accurate and reliable equipment. As a result of this effort has come more sophisticated equipment, thus, demanding more competent Marine Electronic Technicians.

This demand for competent Marine Electronic Technicians has not been met on any level, i.e., research and development, manufacturing, installation, calibration and general marine instrument maintenance.

Due to the nature and environmental conditions of marine instrumentation, the Marine Electronic Technician must utilize special talents and abilities to carry out his daily work in installation, calibration and maintenance.

This curriculum is designed to provide the basic fundamentals and working knowledge of marine instrumentation and encourage the development of individual talents that will enable the technician to successfully cope with established state of the art systems encountered in marine laboratories aboard ship and pleasure craft, as well as land based facilities.

Employment may be found with existing marine electronic firms, fishing fleets, shipbuilders, manufacturers of marine electronics equipment, oceangoing research vessels, and agencies involved in water quality and pollution control.

It is expected that students participating in this program will have successfully completed two years of study at a technical institute in electronics or instrumentation programs or possess the equivalent of two years in the electronics or instrumentation fields.

MARINE ELECTRONICS

SUMMER QUARTER	HOURS PER WEEK Class	Lab	Manipulative Shop	Quarter Hours Credit
T-MSC 130—Oceanography and Oceanographic Instrumentation	2	6	0	5
T-MSC 105—Shipboard Orientation and Basic Seamanship	0	2	0	1
T-ELN 102—Electronic Navaid Systems	3	6	0	6
T-ELN 103—Small Craft Electronics and Electrical Systems	2	2	0	3
T-ELN 104—Shipboard Electro-Mechanical Systems	2	4	0	4
	9	20	0	19

See pages 80 to 120 for Course Descriptions.

MARINE LABORATORY TECHNOLOGY

Graduates of this program will be trained to serve as technica support personnel in general marine and limnological researc facilities. Their role will be assisting scientists with research an development in the natural and physical sciences. Their training wi prepare them to use, maintain, calibrate, and repair a variety c sampling and measuring equipment and instruments, ranging fror small boats through outboard motors to atomic absorption spec trophotometers. They will gain experience participating in actua research projects, utilizing a wide variety of scientific techniques an methods commonly employed in marine and fresh water research.

MARINE LABORATORY TECHNOLOGY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-MAT	121—Technical Mathematics	5	0	0	5
T-ENG	101—Grammar	3	0	0	3
T-BIO	131—Marine Biology I	1	4	0	3
T-MSC	107—Introduction to Oceanography	3	0	0	3
T-WLD	134—Marine Welding*	1	0	3	2
T-MSC	129—Power Boat Operations**	(1)	(4)	0	(3)
T-PME	101—Marine Engines I**	2	0	3	3
T-MSC	117—Practical Experience I	0	0	3	1
		15	4	9	20

*The above course marked with one asterisk is to be taken during either First Quarter or Second Quarter.

**Either of the two courses marked with two asterisks is to be taken First Quarter. The remaining course marked with two asterisks is to be taken Fourth Quarter.

SECOND QUARTER					
T-MAT	122—Technical Mathematics	5	0	0	5
T-ENG	102—Composition	3	0	0	3
T-BIO	132—Marine Biology II	2	0	3	3
T-BIO	201—Aquarium Systems	2	0	3	3
T-WLD	134—Marine Welding*	(1)	0	(3)	(2)
T-MSC	111—Introduction to Net Construction and Repair***	1	4	0	3
T-CHM	101—Introduction to Chemistry***	(3)	(2)	0	(4)
T-MSC	118—Practical Experience II	0	0	3	1
		13	4	9	18

*The above courses marked with one asterisk must be taken this Quarter if it was not taken First Quarter.

The remaining course marked with three asterisks is to be taken Third Quarter.

THIRD QUARTER					
T-MAT	123—Technical Mathematics	5	0	0	5
T-PHY	101—Physics: Properties of Matter	3	2	0	4
T-HED	120—First Aid	2	0	0	2
T-PHO	110—Introduction to Photography	1	0	3	2
T-MSC	111—Introduction to Net Construction and Repair***	(1)	(4)	0	(3)
T-CHM	101—Introduction to Chemistry***	3	2	0	4
T-MSC	119—Practical Experience III	0	0	6	2
		14	4	9	19

***One of the above courses marked with three asterisks must be taken this Quarter if it was not taken Second Quarter.

FOURTH QUARTER					
T-EDP	201—Introducion to Computer Programming	2	0	3	3
T-MSC	108—Oceanographic Instrumentation	2	2	0	3
T-BIO	110—Field Biology	1	4	0	3
T-CHM	109—Chemical Analysis of Natural Waters I	1	4	0	3

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-PHY	102—Physics: Work, Energy, Power	3	2	0	4
T-MSC	129—Power Boat Operations**	1	4	0	3
T-PME	101—Marine Engines I**	(2)	0	(3)	(3)
		10	16	3	19

**One of the above courses marked with two asterisks must be taken this quarter if it was not taken First Quarter.

FIFTH QUARTER

T-ENG	103—Report Writing	3	0	0	3
T-PSY	206-C—Applied Psychology	3	0	0	3
T-BIO	111—Microbiology	2	0	3	3
T-GEO	101—Marine Geology	3	2	0	4
T-ELC	107—Electricity I	4	0	3	5
T-MAT	211—Basic Statistics	5	0	0	5
		20	2	6	23

SIXTH QUARTER

T-ENG	204—Oral Communication	3	0	0	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-ELC	108—Electricity II	4	0	3	5
T-MSC	216—Oceanographic Data Processing	2	4	0	4
T-MSC	220—Practical Experience IV	0	2	3	2
T-PHO	210—Advanced Photography	1	3	0	2
		13	9	6	19

SEVENTH QUARTER

T-SOC	206-C—American Institutions	3	0	0	3
T-CHM	246—Chemical Analysis of Natural Waters II	1	4	0	3
T-ELN	140—Introduction to Marine Electronics	4	2	0	5
T-BIO	213—Marine Vertebrate Zoology	3	2	0	4
T-MSC	221—Practical Experience V	0	0	3	1
T-BIO	225—Marine and Freshwater Ecology	2	0	3	3
		13	8	6	19

See pages 80 to 120 for Course Descriptions.

MARINE TECHNOLOGY

Marine scientific advances of the past decade have led to the development of a strong marine technician training program for North Carolina. A thorough study of marine occupations has shown a great need for personnel trained in various marine-related support operations. The technological developments of the last several years have made available to marine industry new sophisticated equipment such as electronic navigation devices, electronic fish finders, data acquisition and reduction systems. Marine Technology prepares individuals to use and maintain this equipment in conjunction with increased interest in marine exploration and exploitation.

The Marine Technology Program presents a curriculum having a strong base in science and mathematics, essential ingredients for success in today's marine industry. The two year curriculum provides exposure to many practical skills considered necessary by prospective employers. Part of this practical training, including ship operation and scientific support, will be learned aboard Institute and other ships and vessels when circumstances dictate.

Graduates of this program may become involved with scientific data acquisition, analysis and reduction procedures, ship operation, fishing, offshore oil drilling, oil pipeline surveys, marine salvage, marine technology, water treatment plants, nuclear power companies, marinas, boat yards, towboats, yachts or any number of other marine-related scientific or non-scientific activities.

Due to the unique nature of this program, students are from time to time required to take part in ship cruises when other students are normally on break from classes.

MARINE TECHNOLOGY

		HOURS PER WEEK			
FIRST QUARTER		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-ENG	101—Grammar	33	0	0	3
T-MAT	121—Technical Mathematics	55	0	0	5
T-BIO	131—Marine Biology I	11	44	0	3
T-MSC	107—Introduction to Oceanography	33	0	0	3
T-MSC	129—Power Boat Operations*	(11)	(44)	0	(3)
T-PSY	206-C—Applied Psychology	33	0	0	3
T-PME	101—Marine Engines I*	22	0	33	3
T-MSC	121—Ship and Marine Equipment Repair I	0	0	33	1
					21
T-SHI	101—Ship Experiences (Cruises) and/or	As Earned			As Earned
T-SHI	221—Marine Projects	As Earned			As Earned

*Either of the two courses marked with a single asterisk is to be taken First Quarter. The remaining course marked with a single asterisk is to be taken Fourth Quarter.

SECOND QUARTER					
T-ENG	102—Composition	33	0	0	3
T-MAT	122—Technical Mathematics	55	0	0	5
T-SOC	102-C—Principles of Sociology	33	0	0	3
T-MSC	111—Introduction to Net Construction and Repair**	(11)	(44)	0	(3)
T-CHM	101—Introduction to Chemistry**	33	22	0	4
T-BIO	132—Marine Biology II	22	0	33	3
T-HED	120—First Aid***	22	0	0	2
T-MSC	122—Ship and Marine Equipment Repair II	0	0	3	1
					21
T-SHI	102—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	222—Marine Projects	As Earned			As Earned

**Either of the two courses marked with two asterisks is to be taken Second Quarter. The remaining course marked with two asterisks is to be taken Third Quarter.

***The above course marked with three asterisks is to be taken Second Quarter or Fourth Quarter.

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
THIRD QUARTER					
T-MAT	123—Technical Mathematics	55	0	0	5
T-PHY	101—Physics: Properties of Matter	33	22	0	4
T-SOC	206-C—American Institutions****	33	0	0	3
T-MSC	123—Ship and Marine Equipment Repair III	0	0	33	1
T-MSC	111—Introduction to Net Construction and Repair**	11	44	0	3
T-CHM	101—Introduction to Chemistry**	(33)	(22)	0	(4)
T-WLD	134—Marine Welding****	(11)	0	(33)	(2)
T-MSC	101—Navigation I	22	22	0	3
					19
T-SHI	104—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	223—Marine Projects	As Earned			As Earned

*One of the above courses marked with two asterisks must be taken this Quarter if it was not taken Second Quarter.

****Either of the two courses marked with four asterisks is to be taken Third Quarter. The remaining course marked with four asterisks is to be taken Fourth Quarter.

FOURTH QUARTER					
T-MSC	129—Power Boat Operations*	11	44	0	3
T-HED	120—First Aid***	(22)	0	0	(2)
T-MSC	112—Biological Net Construction I	11	44	0	3
T-BIO	110—Field Biology	11	44	0	3
T-WLD	134—Marine Welding****	11	0	33	2
T-MSC	124—Ship and Marine Equipment Repair IV	0	0	33	1
T-CHM	109—Chemical Analysis of Natural Waters*	11	44	0	3
T-SOC	206-C—American Institutions****	(33)	0	0	(3)
T-PME	101—Marine Engines I*	(22)	0	(33)	(3)
					15
T-SHI	103—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	224—Marine Projects	As Earned			As Earned

**One of the above courses marked with one asterisk must be taken this Quarter if it was not taken First Quarter.

***The above course marked with three asterisks must be taken this Quarter if it was not taken Second Quarter.

****One of the above courses marked with four asterisks must be taken this Quarter if it was not taken Third Quarter.

FIFTH QUARTER					
T-MSC	108—Oceanographic Instrumentation	22	22	0	3
T-MSC	202—Introduction to Data Acquisition	22	22	0	3
T-PHY	102—Physics: Work, Energy, Power	33	22	0	4
T-MSC	125—Ship and Marine Equipment Repair V	0	0	33	1
T-MSC	113—Biological Net Construction II	11	44	0	3

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
T-PME	102—Marine Engines II	11	0	33	2
T-EDP	201—Introduction to Computer Programming	22	0	33	3
					19
T-SHI	106—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	225—Marine Projects	As Earned			As Earned

SIXTH QUARTER

T-MSC	102—Navigation II	22	22	0	3
T-ELC	107—Electricity I	44	0	33	5
T-ENG	103—Report Writing	33	0	0	3
T-MAT	211—Basic Statistics	55	0	0	5
T-MSC	205—Data Reduction Techniques	22	22	0	3
T-MSC	126—Ship and Marine Equipment Repair VI	0	0	33	1
T-GEO	101—Marine Geology	33	22	0	4
					24
T-SE	106—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	226—Marine Projects	As Earned			As Earned

SEVENTH QUARTER

T-ENG	204—Oral Communication	33	0	0	3
T-PME	103—Marine Engines III	22	0	33	3
T-ELC	108—Electricity II	44	0	33	5
T-MSC	127—Ship and Marine Equipment Repair VII	0	0	33	1
T-DFT	117—Drafting and Blueprint Reading	33	0	33	4
T-BIO	213—Marine Vertebrate Zoology	33	22	0	4
					20
T-SHI	107—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	227—Marine Projects	As Earned			As Earned

EIGHTH QUARTER

T-MSC	114—Fishing Methods	11	44	0	3
T-MSC	204—Advanced Oceanographic Instrumentation	0	0	33	1
T-ELN	140—Introduction to Marine Electronics	44	22	0	5
T-PME	104—Marine Engines IV	22	0	33	3
T-MSC	224—Chemical Oceanographic Sampling	11	0	33	2
T-PHO	110—Introduction to Photography	11	0	33	2
T-MSC	128—Ship and Marine Equipment Repair VIII	0	0	33	1
					17
T-SHI	108—Ship Experience (Cruises) and/or	As Earned			As Earned
T-SHI	228—Marine Projects	As Earned			As Earned

One week of Cruise (Ship Experience) = 60 hours Contact = 2 credits

See pages 80 to 120 for Course Descriptions.

SECRETARIAL—ENGINEERING AND TECHNICAL

The Engineering and Technical Secretary Curriculum is designed to prepare a student for a position in the office of a firm dealing in research, development and production in the scientific fields. The curriculum offers students the necessary secretarial skills and the required background of understanding and appreciation of the scientific method, the beginnings of a technical vocabulary, and a feeling of respect for accuracy that will be essential in later work in the field.

Graduates of this program may qualify for employment as stenographer-secretaries, technical secretaries, and possibly as private secretaries. They are in demand where engineers and other technical personnel find a need for secretarial help who can understand the specialized language of Electrical, Mechanical, Civil, or Chemical Engineers. The duties of an engineering and technical secretary may consist of taking dictation and reports, meeting office callers and screening telephone calls, filing, and scheduling appointments. Graduates of this program, since they have received a background of science and engineering terminology in addition to their business background, are admirably prepared to work with engineering reports, records and correspondence.

SECRETARIAL — ENGINEERING AND TECHNICAL

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101-C—Grammar and Composition	3	2	0	4
T-BUS	102—Typewriting	2	0	3	3
T-MAT	110—Business Mathematics	5	0	0	5
T-BUS	106—Shorthand	3	2	0	4
T-BUS	110-C—Office Machines	1	2	0	2
		14	6	3	18
SECOND QUARTER					
T-ENG	102-C—Grammar and Composition	3	2	0	4
T-BUS	103—Typewriting	2	0	3	3
T-BUS	107—Shorthand	3	2	0	4
T-BUS	120—Accounting	5	2	0	6
T-MAT	130—Advanced Business Mathematics	5	0	0	5
		18	6	3	22
THIRD QUARTER					
T-BUS	104—Typewriting	2	0	3	3
T-BUS	108—Shorthand	3	2	0	4
T-BUS	121—Accounting	5	2	0	6
T-BUS	183—Terminology and Vocabulary	3	0	0	3
T-BUS	115-C—Business Law	5	0	0	5
		18	4	3	21
FOURTH QUARTER					
T-ECO	102—Economics	3	0	0	3
T-BUS	205—Advanced Typewriting	2	0	3	3
T-BUS	206—Dictation and Transcription	3	2	0	4
T-EDP	104-C—Data Processing Theory	3	2	0	4
T-PSY	206-C—Applied Psychology	3	0	0	3
T-ENG	204—Oral Communication	3	0	0	3
		17	4	3	20
FIFTH QUARTER					
T-BUS	207-C—Dictation and Transcription	3	2	0	4
T-DFT	104—Blueprint Reading-Mechanical	3	0	0	3
T-SOC	102-C—Principles of Sociology	3	0	0	3
T-BUS	209—Advanced Typewriting	2	0	3	3
T-BUS	213-C—Office Procedures	1	2	0	2
T-ENG	206—Business Communication	3	0	0	3
		15	4	3	18
SIXTH QUARTER					
T-BUS	112—Filing	3	0	0	3
T-BUS	208—Dictation and Transcription	3	2	0	4
T-BUS	210—Advanced Typewriting	2	0	3	3
T-BUS	235-C—Business Management	3	2	0	4
T-SOC	206-C—American Institutions	3	0	0	3
		14	4	3	17

See pages 80 to 120 for Course Descriptions.

TECHNICAL COURSE DESCRIPTIONS

T-Ahr 101—Fundamentals of Refrigeration I: Terminology, laws of refrigeration, absolute pressure and absolute temperature, energy conversion units; specific heat, and latent heat; measurement of heat in quantity and intensity; tone of refrigeration; pressure-temperature relationships; transfer of heat by conduction, convection and radiation; elementary refrigeration, refrigeration cycle and refrigerant controls. Tools, materials and methods applicable to air conditioning and refrigeration.

Course Hours Per Week: Class 4, M. Lab 3. Quarter Hours Credit 5.
Prerequisite: None

T-Ahr 102—Fundamentals of Refrigeration II: Refrigerants and their application in commercial refrigeration; system components accessories, installation procedures and techniques; diagnosing service problems of mechanical difficulties; methods of defrosting; and making sketches of designs for high, medium and low temperature installations. Symbols for refrigeration and piping equipment will be used in making sketches.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisites: T-Ahr 101, T-Phy 101

T-Arc 101—Architectural Graphics I: This course is designed to provide fundamental knowledge of the principles of graphics as they apply to architecture. The basic skills and techniques of architectural expression, sketching and architectural lettering are stressed. Geometrical construction, orthographic drawing, and projection problems dealing with descriptive geometry in architecture are studied. A basic study of contemporary architects and their work is also presented to acquaint the student with present day architecture.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: None

T-Arc 102—Architectural Graphics II: A continuation of the fundamental knowledge of the principles of architectural graphics. Drafting expression in architectural drawing is studied with the basic controls of line quality and drafting technique stressed. The introduction to basic architectural drafting and working drawing, which will lead to the student's ability to express entailing ideas and skillful graphic communication on a professional level, is initiated. The study of contemporary architects, sketching and architectural lettering is continued.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: T-Arc 101

T-Arc 103—Architectural Graphics III: The study of architectural drafting expression techniques and descriptive geometry applications are continued in depth. The student studies typical architectural details and techniques relative to the preparation of detailed working drawings. Using preliminary sketches, the student will proceed and complete a full set of working drawings, on a professional level, of a small light framed building. Good use of appropriate drafting expression and techniques will be stressed. Continued study and practice of architectural lettering and sketching will be stressed.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisites: T-Arc 101, T-Arc 102

T-Arc 121—Architectural Materials and Methods I: General broad base study of basic materials and methods used in the construction of architectural structures will be studied. Field trips to manufacturing sites and study of light construction techniques are included.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: T-Arc 101

T-Arc 135—Codes, Contract Documents, and Specifications: A study of building codes and their effect in relation to specifications and drawings. The purpose and writing of specifications will be studied along with their legal and practical application to working drawings. Contract documents will be analyzed and studied for the purpose of client-architect-contractor responsibilities, duties and mutual responsibilities.

Course Hours Per Week: Class 2, M. Lab 9. Quarter Hours Credit 5.
Prerequisite: T-Arc 101

T-Arc 201—Architectural Graphics IV: The integration of structural components in architectural working drawings relative to steel, concrete and timber structural elements will be stressed. Working drawings will be prepared to indicate appropriate details necessary for fabrication and erection of structural members and connections. The correlation of shop drawings with working drawings will be studied. Reference material will be introduced to provide the necessary information to prepare structural drawings and to provide the student with skills and knowledge in locating data and in using handbooks.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisites: T-Arc 101, T-Arc 102, T-Arc 103

T-Art 100-C—The Elements of Commercial Art: A study of the elements and principles of design and composition. Emphasis will be placed on learning how the properly applied principles and elements of design make commercial art most effective. Line, shape, value, texture, and color will be discussed in relation to specific examples of commercial art.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 101—Human Anatomy and Physiology I: A study of the organizational plan of the human body and the body systems concerned with motor activities, control and integration of functions, and reproduction. Laboratory experiences provide opportunities to see animal specimens illustrative of systems being studied.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

T-Bio 107—Human Anatomy and Physiology II: A study of the structure and normal function of the human body with man identified as a living organism composed of living cells, tissues, organs, and systems. Included are the basic physiologic aspects of skin; the skeletal, articular, muscular, and nervous systems; and the special senses. A laboratory portion should include relevant experiments to augment the student's learning of body structure and function.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

T-Bio 108—Human Anatomy and Physiology III: A continuation of the study of the structure and normal function of man as a living organism. Special emphasis is on the circulatory, lymphatic, respiratory, digestive, urinary, endocrine, and reproductive systems and fluid and electrolyte balance. Laboratory experiences include study of models and small animal dissection for insight into comparative structure and function of man.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: T-Bio 107

T-Bio 110—Field Biology: A field course in which the students will be involved in doing a biological survey of the Cape Fear River Estuary. Collection methods and data compilation will be taught.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 111—Microbiology: A survey of the principles and laboratory techniques employed in the study of microorganism. The ecology of microbes in aquatic biology will be stressed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 115—Medical Terminology and Vocabulary I: An introductory course for paramedical personnel, which deals with basic tools for building a medical vocabulary and mastering the identification of anatomical roots, prefixes and suffixes of words, as well as Greek and Latin verbs and adjectives. Anatomical body parts, diseases, operations, tumors, drugs, and descriptive terms are emphasized by analysis of the terms and structures of the words.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 116—Medical Terminology and Vocabulary II: Continuation of the study of medical terminology in building a medical vocabulary which deals with the mastery of the identification of anatomical roots, prefixes, and suffixes of words, as well as Greek and Latin verbs and adjectives. Anatomical body parts, diseases, operations, tumors, drugs, and descriptive terms are emphasized by analysis of the terms and structure of the words. Additional emphasis will be in the area of mental health and illness as well as anesthesia and laboratory terminology.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Bio 115

T-Bio 131—Marine Invertebrate Zoology I: A practical course designed to acquaint the student with the classification and natural history of marine organisms common to the North Carolina coast. Emphasis will be on collection methods and identification of marine specimens. The student will be required to complete a collection of marine organisms identified to species.

Course Hours Per Week: Class 2, Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 132—Marine Invertebrate Zoology II: A continuation of T-Bio 131. Major invertebrate marine organisms will continue to be discussed. Laboratory work will involve collecting methods and identification of planktonic organisms. Laboratory assignments on selected marine invertebrate may be included. Various types of biological sampling gear will be discussed and demonstrated.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bio 131

T-Bio 201—Aquarium Systems: A comprehensive course which teaches the student the proper methods of setting up and maintaining healthy marine and fresh water aquaria. Emphasis is placed on water quality and animal management techniques.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bio 213—Marine Vertebrate Zoology: Major vertebrate organisms will be discussed. Emphasis will be on identification and natural history of marine vertebrates.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Bio 225—Marine and Freshwater Ecology: A survey course covering the fundamentals of ecology with primary emphasis on marine and freshwater organisms. Effects of changes in the physical and chemical parameters of water on marine and freshwater organisms will be discussed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bio 111

T-Bus 102—Typewriting: Introduction to the touch typewriting systems with emphasis on correct techniques, mastery of the keyboard, simple business correspondence, tabulation, and manuscripts. Minimum speed requirement—20 gross words a minute with 5 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bus 103—Typewriting: Instruction emphasizes the development of speed and accuracy with further mastery of correct typewriting techniques. These skills and techniques are applied in tabulation, manuscript, correspondence, and business forms. Minimum speed requirement—30 gross words a minute with 5 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bus 102 or Equivalent

T-Bus 104—Typewriting: Emphasis on production typing problems and speed building. Attention to the development of the student's ability to function as an expert typist, producing mailable copies. The production units are tabulation, manuscript, correspondence and business forms. Minimum speed requirement—35 gross words a minute with 4 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bus 103 or Equivalent

T-Bus 106—Shorthand: A beginning course in the theory and practice of reading and writing shorthand. Emphasis on phonetics, penmanship, word families, brief forms, and phrases.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Bus 107—Shorthand: Continued study of theory with greater emphasis on dictation and elementary transcription.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 106 or Equivalent

T-Bus 108—Shorthand: Theory and speed building. Introduction to office-style dictation. Emphasis on development of speed in dictation and accuracy in transcription.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 107

T-Bus 110-C—Office Machines: A general survey of business and office machines. Students will receive training in techniques, operation, and application of the ten-key adding machine, electronic display calculator, and electronic printing calculator.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: None

T-Bus 112—Filing: Fundamentals of indexing and filing, combining theory and practice by the use of miniature letters, filing boxes and guides. Alphabetic, Triple Check, Automatic, Geographic, Subject, Soundex, and Dewey Decimal filing.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bus 115-C—Business Law: A general course designed to acquaint the student with certain fundamentals and principles of business law, including contracts, negotiable instruments, and agencies.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Bus 120—Accounting: Principles, techniques and tools of accounting, for understanding of the mechanics of accounting. Collecting, summarizing, analyzing, and reporting information about service and mercantile enterprises, to include practical application of the principles learned.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequiste: T-Mat 110

T-Bus 121—Accounting: Partnership and corporation accounting including a study of payrolls, federal and state taxes. Emphasis is placed on the recording, summarizing and interpreting data for management controls rather than on bookkeeping skills. Accounting services are shown as they contribute to the recognition and solution of management problems.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: T-Bus 120

T-Bus 122—Accounting: Advanced practice problems in accounting. Emphasis on detailed and accurate interpretation of data for management.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: T-Bus 121

T-Bus 123-C—Business Finance: Financing of business units, as individuals, partnerships, corporations, and trusts. A detailed study is made of short-term, long-term, and consumer financing.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 121

T-Bus 124-C—Business Finance: Financing, federal, state, and local governments and the ensuing effects upon the economy. Factors affecting supply of funds, monetary and credit policies.

Course Hours Per Week: Class 3, Lab 2 Quarter Hours Credit 4.
Prerequisite: T-Bus 123-C

T-Bus 183—Terminology and Vocabulary: To develop an understanding of the terminology and vocabulary appropriate to the course of study, as it is used in business, technical, and professional offices.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bus 205—Advanced Typewriting: Emphasis is placed on the development of individual production rates. The student learns the techniques needed in planning and in typing projects that closely approximate the work appropriate to the field of study. These projects include review of letter forms, methods of duplication, statistical tabulation, and the typing of reports, manuscripts and legal documents. Minimum speed requirement—40 gross words a minute with 3 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bus 104

T-Bus 206—Dictation and Transcription: Develops the skill of taking dictation and of transcribing at the typewriter materials appropriate to the course of study, which includes a review of the theory and the dictation of familiar and unfamiliar material at varying rates of speed. Minimum dictation rate of 80 words per minute for three minutes on new material.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 108

T-Bus 207-C—Dictation and Transcription: Covering materials appropriate to the course of study, the student develops the accuracy, speed, and vocabulary that will enable her to meet the stenographic requirements of business and professional offices.

Minimum dictation rate of 90 words per minute required for three minutes on new material.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 206

T-Bus 208—Dictation and Transcription: Principally a speed building course, covering materials appropriate to the course of study, with emphasis on speed as well as accuracy. Minimum dictation rate of 100 words per minute required for 3 minutes on new material.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 207

T-Bus 209—Advanced Typewriting: Emphasis is placed on speed building and on typing projects related to actual office situations. These include additional duplication, tabulation, and the typing of rough-draft and straight-copy documents, reports, and forms used in legal, technical and business offices. Minimum speed requirement—45 gross words a minute with 3 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bus 205

T-Bus 210—Advanced Typewriting: A course designed to fill the need of the student in his final quarter of typewriting. Additional emphasis placed on accuracy and speed. Minimum requirement—50 gross words a minute with 3 errors allowed.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Bus 209

T-Bus 212—Machine Transcription: A study and practice in the use of transcribing machines in business dictation. Proficiency in word usage, correct grammar, and letter styles will be emphasized.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: T-Bus 103

T-Bus 213—Office Procedures: Designed to acquaint the student with the responsibilities encountered by a general office worker during the day. These include the following: receptionist duties, handling the mail, telephone techniques, travel information, office records, purchasing of supplies, office organization, and insurance claims.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: T-Bus 103

T-Bus 220-C—Managerial Accounting: Emphasizes the analysis of accounting data. Accounting data is evaluated as to usefulness in predicting the risks involved in management decisions. Problem situations that require the analysis of the effectiveness of accounting information get the student totally involved with major management concepts.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: T-Bus 121

T-Bus 229—Taxes: Application of federal and state taxes to various businesses and business conditions. A study of the following taxes: income, payroll, intangible, capital gain, sales and use, excise and inheritance.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Bus 121

T-Bus 232-C—Sales Development: A study of retail, wholesale and specialty selling. Emphasis is placed upon mastering and applying the fundamentals of selling. Preparation for and execution of sales demonstrations required.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Bus 235-C—Business Management: Principles of business management including overview of major functions of management, such as planning, staffing, controlling, directing, and financing. Clarification of the decision-making function versus the operating function. Role of management in business qualifications and requirements.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Bus 239—Marketing: A study of the marketing structure within the framework of the U.S. economic system. It includes the study of the movement of goods from producer to consumer through various channels of distribution, the functions of marketing, the social and economic implications.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Bus 272—Principles of Supervision: Introduces the basic responsibilities and duties of the supervisor and his relationship to superiors, subordinates, and associates. Emphasis on securing an effective work force and the role of the supervisor. Methods of supervision are stressed.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cat 106-C—Figure Drawing: The human figure and its expressive potentials. The student will gain experience in perspective, light and shade, mass, size and placement, character and expression in graphite, pen and ink, crayon and chalk, transparent and opaque watercolor.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cat 121-C—Basic Design: A study of the basic design fundamentals and principles, and visual problem solving methods. Emphasis is placed upon assigned problems in basic design. Studio terminology, equipment, and materials will also be stressed.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cat 137-C—Specialty Drawing: The instruction of individual selection of materials and techniques for cartoons and sketches—light illustration for use is sales promotion, TV, newspaper and magazine publication.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cat 201-C—Typography & Lettering: Fundamentals of lettering. Execution of finished lettering for reproduction. Lettering and typography indication for layouts and comprehensive design. A survey of typographic terminology, equipment and materials. Applied problems in various mediums.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cat 204-C—Advertising Copy: Basic skills required of the advertising design artist, originating concepts and effective solutions in selected layouts. Emphasis will be placed on graphic representation and layout techniques.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cat 206-C—Brochure Design: Design and preparation of art work and copy for various types of brochures including "flyers," multifold and multipage brochures.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Chm 101—Introduction to Chemistry: A basic introduction to elements, compounds, mixtures, symbols, formulas, weight relations in reactions, and solutions. The student will be introduced to basic laboratory equipment and techniques.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Mat 121

T-Chm 109—Chemical Analysis of Natural Waters I: Essentially a laboratory course introducing the techniques and equipment used in the analysis of natural water. The student will carry out determinations of chorinity, salinity, dissolved oxygen, phosphate, nitrate, and silicate.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: T-Chm 101

T-Chm 114—Basic Chemical Concepts: The student is introduced to some of the basic concepts of chemistry; to the elements in general; to physical properties of elements and compounds; to generalized chemical reactions; the major differences between organic and inorganic chemicals with respect to bondings are discussed.

Course Hours Per Week: Class 5, Lab 6. Quarter Hours Credit 8.
Prerequisite: None

T-Chm 115—Industrial Chemistry: Several well known processes for the production of chemical products will be studied in detail. The student will learn why chemicals are used to produce specific results, how they are handled, and some of the ways reactions may be controlled.

Course Hours Per Week: Class 5, Lab 6. Quarter Hours Credit 8.
Prerequisite: T-Chm 114

T-Chm 115-C—Instrumentation Chemistry: This chemistry course has been designed to acquaint the Instrumentation student with some of the basic chemical concepts. In the laboratory, these concepts will be put into practice using industrial type equipment to gather the necessary data.

Course Hours Per Week: Class 5, M. Lab 3. Quarter Hours Credit 6.
Prerequisite: None

T-Chm 116—Industrial Chemistry: This course is a more detailed coverage of industrial chemical processes and includes a thorough discussion of the more important metals and non-metals.

Course Hours Per Week: Class 5, Lab 6. Quarter Hours Credit 8.
Prerequisite: T-Chm 115

T-Chm 117-C—Unit Processes: The student will operate industrial type equipment, take samples, record data and perform any other duties normally connected with a unit operation. He will be given detailed instructions that must be read, understood and followed. He will assist in the assembly of equipment and any repair work that needs to be done "on the job."

Course Hours Per Week: Lab 20. Quarter Hours Credit 10.
Prerequisites: T-Chm 116, T-Phy 103, T-Mat 107

T-Chm 150—Industrial Operations: The student learns about the designs and operation of various standard pieces of equipment used in the chemical industry. The use of various materials of construction will be discussed in each case.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Chm 151—Industrial Operations: This is a continuation of the course started in the third quarter.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Chm 150

T-Chm 180—Water Technology: This course covers the many forms of pollution of water and how this pollution would limit the use of water in specific applications. Also, the various methods of purifying water on an industrial scale will be discussed.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Chm 150

T-Chm 230—Organic Chemistry: The student will study the various families of carbon chemistry from the simplest alkane to rather complex polymerization products. He will learn how organic compounds are prepared and some of the specialized reactions that the various groups undergo. Laboratory work will acquaint the student with a number of naturally occurring chemicals. Preparation of derivatives and specialized tests will be used for identification purposes.

Course Hours Per Week: Class 3, Lab 6. Quarter Hours Credit 6.
Prerequisite: T-Chm 114

T-Chm 231-C—Organic Chemistry: This is a continuation of the course started in the fifth quarter.

Course Hours Per Week: Class 3, Lab 6. Quarter Hours Credit 6.
Prerequisite: T-Chm 230

T-Chm 232-C—Organic Chemistry: This is a continuation of T-Chm 231, the course started in the sixth quarter.

Course Hours Per Week: Class 3, Lab 6. Quarter Hours Credit 6.
Prerequisite: T-Chm 231-C

T-Chm 243—Industrial Analysis: The student will learn to follow analytical procedures involving acid-base reactions, oxidation reduction reactions utilizing volumetric and gravimetric methods. Industrial type instruments will be used where applicable. The principles of qualitative and quantitative analysis will be combined for the isolation, identification and percentage determination of various mixtures. The determination of physical constants will be thoroughly used.

Course Hours Per Week: Class 1, Lab 10. Quarter Hours Credit 6.
Prerequisites: T-Chm 114, T-Mat 104-105

T-Chm 244—Industrial Analysis: This is a continuation of the course started in the fifth quarter.

Course Hours Per Week: Class 1, Lab 10. Quarter Hours Credit 6.
Prerequisite: T-Chm 243.

T-Chm 245—Industrial Analysis: This is a continuation of the course started in the sixth quarter.

Course Hours Per Week: Class 1, Lab 10. Quarter Hours Credit 6.
Prerequisite: T-Chm 244

T-Chm 246—Chemical Analysis of Natural Waters II: A continuation of T-Chm 109 in which the students will collect water samples and run analyses on them using the techniques of colorimetry, atomic absorption spectroscopy, fluorometry, and specific ion analysis.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: T-Chm 109

T-Civ 101—Surveying I: Care and use of instruments; theory and practice of plane surveying including taping, differential and profile leveling, transit, stadia, and transit-tape surveys.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Mat 121

T-Civ 201—Properties of Engineering Materials: Study and testing of the properties of ferrous and non-ferrous metals, timber, stone, clay products, bitumious cementing materials and plastics; load and strain measurements; behavior of materials under load; qualities other than strength; control of the properties of the materials; non-destructive tests.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Civ 216—Strength of Materials: Study of principles and analysis of stresses which occur within machine and structure elements subjected to various types of loads such as static, impact, varying and dynamic. Analyses of these stresses are made as applied to riveted and welded joints, beams, shafts, keys and couplings and other machine components.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Civ 217—Construction Planning, Equipment and Methods: Excavating methods and equipment used in building and highway construction; pile driving; construction techniques and equipment used in reinforced concrete buildings, bridges, lift-slabs, thin-shells and folded plates, erection methods and equipment for structural steel buildings and bridges, carpentry in house and heavy timber construction; construction safety. Field Inspection trips.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Civ 218—Plain Concrete: Study and testing of the composition and properties of concrete including concrete cementing agents, aggregates, admixtures, and air entrainment; design and proportioning of concrete mixes to obtain predetermined strengths and properties; methods of placing and curing concrete; standard control tests of concrete.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Civ 223—Codes, Contracts, and Specifications: Basic principles and methods most significant in contract relationships; appreciation of the legal considerations in construction work; study of the National Building Code and local building codes; interpreting and outlining specifications.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: T-Civ 201

T-Cjc 101—Introduction to Criminal Justice: A study of State and Federal criminal justice agencies, their jurisdictions, organization, purpose, and objectives.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 102—Introduction to Criminology: A general course designed to familiarize the student with contemporary and historical theories of criminal behavior. An overflow of factors attributing to criminal behavior and the behavior on society will also be given.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 103—Introduction to Criminal Investigation: A study of the elements of

investigation from discovery through presentation in court. The student is introduced to preliminary investigation, crime scene investigation, collection and preservation of evidence, interviews and interrogation, descriptions of persons and property, sources of information, investigative report writing and case presentation.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 104—Patrol and Procedure and Traffic Law Enforcement: This course defines purposes of patrolling and describes types of patrols. It explains operation of police vehicles on patrol, answering calls—emergency and non-emergency—and "felony in progress." It provides the student the opportunity to develop powers of perception and observation concerning persons, places and things. Motor vehicle laws most frequently violated, traffic accident reports and overall traffic enforcement objectives will also be given.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

T-Cjc 105—Firearms: A study to help the student develop an understanding of the need, use and respect for all kinds of firearms. Range practice will be given in the use of rifles, shotguns, and pistols with a special effort made to develop proficiency in the use of the service revolver. Instruction will be given in non-lethal weapons such as tear gas, and defensive tactics used in the handling of arrested persons.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Cjc 106—Teaching Methods: A study designed to develop the ability and skill of students in researching subject matter, in preparing instruction outlines, in developing and properly using audiovisual materials, and in presented data.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisites: Eng 101 and Eng 102

T-Cjc 110—Law Enforcement Role in Crime and Delinquency: A study of scientific efforts to understand crime and man in relation to crime phenomena including definitions and formulations of crime and criminals upon which an adaptation system of criminology must be based. The law is examined as the framework within which social deviations of a particular character assume their functions as criminal acts and broad principles upon which a science of criminology must rest.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 112—Criminal Justice Seminar: A course in which the student is able to observe and participate to some degree in a criminal justice agency. This course is only open to pre-service students for credit.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Cjc 115—Criminal Law: A study of constitutional law, the elements of criminal laws, legal definitions, the laws of arrest, search and seizure, and the rules of evidence.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 125—Due Process Court Structure and Procedure: This course is designed to provide the student with a review of court systems; procedures from incident to final disposition; principles of constitutional, federal, state and civil laws as they apply to and affect law enforcement.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 203—Forensic Photography: A survey of the use of photography as evidence in criminal investigation. The student is exposed to the scientific and the legal requirements of photography as evidence. The student will be taught techniques of police photography, photographic equipment, and darkroom procedures. The student will photograph simulated crime scenes, develop his own film, and prepare photographic exhibits for courtroom testimony.

Course Hours Per Week: Class 4. Quarter Hours Credit 4.
Prerequisite: None

T-Cjc 205—Scientific Evidence: A study of the kinds and degrees of evidence and the rules governing the admissibility of evidence in court.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 210—Criminal Investigation: An introduction to the fundamentals of investigation, crime scene search, recording, collection and preservation of evidence; case preparation and court presentation; and the investigation of specific offenses such as arson, narcotics, sex, larceny, burglary, robbery and homicide.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 211—Introduction to Criminalistics: A general survey of the methods and techniques used in modern scientific investigation of crime, with emphasis on the practical use of these methods by the students. Laboratory techniques will be demonstrated and the student will participate in actual use of the scientific equipment.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisites: T-Cjc 210

T-Cjc 212—Narcotics Investigation: A study to equip the officer with knowledge of the techniques involved in the enforcement of narcotics and dangerous drug law. This objective is accomplished by courses of a practical and technical nature. In addition, the officer is exposed to a number of informational oriented courses designed to equip him to become involved in drug abuse prevention in his community.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Cjc 213—Juvenile Justice Administration: The Juvenile Justice Administration course deals with: youth crimes; diversion of youthful offenders; discretion on the part of the officer in dealing with youth offenders; the procedures in dealing with the juvenile court; juvenile probation, and community based corrections; and prevention of delinquency. Thus, the student is given the most modern philosophy and an in-depth of understanding of the problems of Juvenile Justice Administration.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 220—Law Enforcement Organization and Management: The principles of organization and administration of law enforcement, recruitment, selection, training, discipline, and promotion; the functional division of the modern police department; and the future professionalism of the police services.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 221—Law Enforcement Supervision: A study of the fundamentals of supervision; qualities of a supervisor; the supervisor's role in administration, decision making, employer-employee relations, leadership, motivation; the supervisor's role in training, personnel evaluation, performance rating, personnel complaints, and discipline.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 222—Crime Scene Investigation: Primary emphasis will be on crime scene processing, identification of physical evidence, chain of custody, handling and care of physical evidence. Specialized areas include: trace evidence, casting and molding, glass fractures, and questioned documents.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 224—Industrial Security: This course is a general survey of the methods and techniques utilized in theft prevention. Primary emphasis will be placed on alarm systems used in industry.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Cjc 229—Research Seminar: Open to criminal justice students only. Research on problems approved by the Department Chairman. The students research may be submitted to a local, state, national or international criminal justice journal for publication.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisites: T-Eng 101, T-Eng 102, T-Eng 103

T-Dft 101—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Dft 101-C—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning. The principles of isometric drawings are introduced. Problems involving points, lines, and planes shall be studied.

Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 4.
Prerequisite: None

T-Dft 102-C—Technical Drafting: Intersection and developments and their practical solutions. Where applicable, model solutions accompany the problems. Sections and conventions will be studied.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: T-Dft 101-C

T-Dft 103-C—Technical Drafting: The application of orthographic projection principles to the more complex drafting problems, primary and secondary auxiliary views, simple and successive revolutions, will be studied. Dimensioning practices for

"details" and "working drawings," approved by the American Standards Association will also be included. Screws, screw threads, springs, keys, rivets will be covered.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Dft 102-C

T-Dft 104—Blueprint Reading: Mechanical: Interpretation and reading of blueprints. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.

Course Hours Per Week: Class 3. Quarter Hours 3.
Prerequisite: None

T-Dft 106—Architectural Drafting: Basic technique and skills of drafting are developed in conjunction with a study of the graphical analysis of space problems. Problems deal with points, lines, and planes in space studied by freehand and mechanical drawing methods. Proficiency in two-dimensional—three-dimensional relationships is developed through use of orthographic and isometric sketching and drafting. Lettering is emphasized and developed through concentrated lettering practice and through labeling of all drawings and exercises.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Dft 101

T-Dft 107—Architectural Drafting: Development of techniques in architectural lettering, symbols, and their interpretation. Freehand and instrument drafting. Drawing of construction details, using appropriate material symbols and connections. Sections and scale details will be prepared from preliminary sketches. Applications of descriptive geometry are used in visualization and analytical solutions of the drafting problems involving auxiliary views, intersections and developments.

Course Hours Per Week: Class 2, Lab 4. Quarter Hours Credit 4.
Prerequisite: T-Dft 101

T-Dft 108—Architectural Drafting: An approach, in depth, to the study of architectural drafting. Development of techniques in lettering, dimensioning, freehand sketching and instrument drawing. Drawing of construction details using appropriate symbols and conventions are developed from sketched details and characteristics of the construction details to be drawn are studied and reported on through supplementary research.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: T-Dft 107

T-Dft 110—Technical Sketching: A course in the development of skill in sketching as a means of communication through the drawing medium, extension of verbal and written communication and through extension and problem analysis.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Dft 112—Electronic Drafting: This course will provide experience in the various types of drawings used by the electronics industry. Chassis layouts, block diagrams, circuit diagrams, and related mechanical drawings will be included.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Dft 117—Drafting and Blueprint Reading: The field of drafting is introduced. The student learns of the elementary practices and principles employed by draftsmen. This knowledge is put to use reading actual blueprints. Orthographic, pictorial sketching, standards and practices of dimensioning are included for communication from technician to machinist or other artisan.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Dft 118—Drafting and Blueprint Interpretation: Basic drafting techniques are covered to provide a working knowledge of drafting as a tool for communicating ideas. Reading and interpreting of blueprints is emphasized.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Dft 201—Technical Drafting: Basic mechanisms of motion transfer, gears and cams, will be studied and drawn with emphasis on methods of specifying, calculating, dimensions, and delineating. Topographical drawing and mapping will be introduced. Plat plans, contours and profiles will be drawn. Use and care of the transit will be studied in the field.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: T-Dft 103-C

T-Dft 206—Design Drafting: Research to solve a problem in design by consulting various manuals, periodicals, and through laboratory experiments. Preliminary design sketches layout drawings, detail drawings, assembly and sub-assembly drawings, and specifications are required as a part of the problem.

Course Hours Per Week: Class 4, M. Lab 9. Quarter Hours Credit 7.
Prerequisite: T-Dft 201

T-Dft 208—Introduction to Architectural Drafting: Introduction to basic principles of architectural drawings. Included are floor plans, elevations, wall sections, details, site plans, electrical plan, plumbing plan, heating plan, and foundation plans. Following this information, the course will introduce model making as a media for study and visualization of architectural and engineering concepts.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: T-Dft 102-C or Consent of Instructor

T-Dft 211—Mechanisms: Mathematical and drafting room solutions of problems involving the principles of machine elements. Study of motions of linkages, velocities and acceleration of points within a link mechanism; layout methods for designing cams, belts, pulleys, gears and gear trains.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisites: T-Dft 201, T-Mat 122, T-Phy 106

T-Dft 213—Marine Construction Drafting: Introduction to basic principles of architectural drawings. Included are floor plans, elevations, wall sections, details, site plans, and foundation plans. Following this information, the course will introduce buildings on pilings. Piers and bulkheads associated with marine construction will be introduced.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Dft 117

T-Dft 220—Architectural Drafting: Drawing of structural plans and details as prepared for building construction including steel, concrete and timber structural components. Appropriate details and drawings necessary for construction fabrication of structural members. Reference materials will be used to provide the draftsman with skills and knowledge in locating data and in using handbooks.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Dft 108

T-Dft 221—Architectural Drafting: An approach in depth to the study of architectural drafting continuing the study of details of construction and introducing the elements of mechanical and electrical equipment systems and their relationship to a finished building.

Course Hours Per Week: Class 2, M. Lab 9. Quarter Hours Credit 5.
Prerequisite: T-Dft 220

T-Dft 222—Architectural Drafting: An approach in depth to the study of architectural drafting in which the final group of detailing types is added and in which the various parts of construction covered in previous courses is assembled to produce a generally complete set of drawings for a simple building.

Course Hours Per Week: Class 2, M. Lab 9. Quarter Hours Credit 5.
Prerequisite: T-Dft 221

T-Dft 230—Structural Drafting: A concentrated study and drawing of structural components of buildings to include steel, reinforced concrete, and timber structures. Appropriate symbols, conventions, dimensioning practices, and notes as used by the draftsman will be included. Emphasis will be placed on drafting of appropriate drawings for fabrication and erection of the structural components.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Dft 220

T-Dft 231—Architectural Mechanical Equipment Drafting: A detailed study of mechanical and electrical equipment and the reading and interpretation of detailed mechanical and electrical system drawings prepared by the respective engineering consultants. Heating, air conditioning, lighting, electrical service, water, waste and other architectural structural service systems will be studied. Emphasis will be placed on symbols, graphic representation techniques and the actual preparation of mechanical and electrical drawings.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: None

T-Dft 233—Architectural Office Practice Seminar: A study of the professional relationship of the architectural firm in relation to clients, contractors, suppliers, consultants and other architects. Ethics of the profession as applicable to the draftsman's role in the architectural firm will be stressed.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

T-Dft 235—Codes, Specifications and Contract Documents: A study of building codes and their effect in relation to specifications and drawings. The purpose and writing of specifications will be studied along with their legal and practical application to working drawings. Contract documents will be analyzed and studied for the purpose of client-architect-contractor responsibilities, duties and mutual responsibilities.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: T-Dft 231

T-Dft 236—Construction Estimating and Field Inspection: Interpretation of working drawings for a project; preparation of material and labor quantity surveys from plans and specifications; approximate and detailed estimates of cost. The student will study materials take-off, labor take-off, sub-contractors' estimates, overhead costs, and bid and contract procedures. Detailed inspection of the construction by comparing the finished work to the specifications.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: T-Dft 235

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Eco 104—Economics: Greater depth in principles of economics, including a penetration into the composition and pricing of national output, distribution of income, international trade and finance, and current economic problems.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Eco 102

T-Eco 108—Consumer Economics: This course is designed to help the student use his resources of time, energy, and money to get the most out of life. It gives the student an opportunity to build useful skills in buying, managing his finances, increasing his resources, and to understand better the economy in which he lives.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Edp 104-C—Data Processing Theory: Fundamental concepts and operational principles of data processing systems, as an aid in developing a basic knowledge of computers, a prerequisite to the detail study of particular computer problems.

Course Hours Per Week: Class 3, Lab. 2. Quarter Hours Credit 4.
Prerequisite: None

T-Edp 201—Introduction to Computer Programming: This course introduces the student to the operation of a computer terminal connected to a computer and the process of developing simple programs for problem solving for this computer. Topics covered include Algorithms, Flowcharting, Commands, Statements, Built-in Functions, Arrays, and Strings. Applications in this course will depend on the curriculum in which the student is enrolled.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Edp 211—Advanced Programming: This course has a dual purpose: to introduce computer concepts, and to gain increased proficiency in programming. Computer concepts will include such topics as input-output devices, storage devices, central processor functions and physical makeup, operating systems, internal and external data representation, and Boolean logic. The laboratory will consist of typical programming problems selected from such topics as report generation, plotting, equation solving, accuracy of numerical results, higher precision computation, simulation, and use of files.

Course Hours Per Week: Class 2. Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Edp 201

T-Edu 121—Seminar Practicum: Designed to provide observational opportunities to promote objectivity in recording children's behavior. Interpretation of children's behavior will be explored via the on-the-spot record.

Course Hours Per Week: V. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Edu 122—Seminar Practicum: Designed to provide observational activities and participation to enhance the understanding of physical, motor, and language development in the young child.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Edu 124—Seminar Practicum: The Seminar Practicum places the students in a variety of educational experiences. To enable the student to better understand the preschool child, Edu 124 will concentrate on the young child in the classroom setting.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Edu 221—Seminar Practicum: The Seminar Practicum experience involves

students with a variety of educational settings. In order that the student may gain a basic understanding of what constitutes testing young children, Edu 221 will focus on the role of the teacher and student in the classroom.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Edu 222—Seminar Practicum: This is a continuation or culmination of the total Seminar Practicum experience in early childhood education. It is a learning-by-doing in the actual classroom situation. The emphasis during the final quarter being Organizing for the Classroom.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: None

T-Edu 231—Creative Activities: Individual and group exploration of activities and media for promoting optimal self expression, aesthetic appreciation, and creativity in young children.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Edu 233—Nutrition: The study of basic nutrition, with emphasis on methods of helping young children and their families learn nutritional concepts for more healthful living.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Egr 101—Introduction to Engineering Technology: An overview of the field of engineering technology, with a discussion of the work of the technician, and his role in the engineering and industrial organizations. The "Conceptual Approach" will give the student an idea of the whole engineering technology. Practice in engineering methodology will be stressed, including development of carefulness and orderliness, use of curves and tables, calculations, experimental laboratory procedures, etc. Field trips give the student an opportunity to see the engineering technician in action. Permanent placement and summer work opportunities will be discussed.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Egr 104—Basic Design Principles: A study of the Fundamentals of Engineering Design which relates to the philosophy and discipline of design. Topics covered include Brainstorming, Creativity, Models, Optimization Prototypes, Synthetics, Testing and the phases of Design: Feasibility Study, Preliminary Design and Detail Design.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Egy 101—Introduction to Energy Resources: Economics of Energy, history and development of use of energy by man. Comparison of energy alternatives. Examination of historical projections of geophysical experts on energy supply and usage, costs and benefits of production. Distribution and use of various energy resources.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Egy 102—Introduction to Solar Energy Systems (Thermal): Fundamentals of solar energy thermal systems for space heating, cooling and hot water heating. History, economics and survey of the current state of the art. In laboratory the student will have hands on experience with simple systems including performance measurement, testing and possible light construction.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

T-Egy 103—Introduction to Solar Energy Systems (Electrical): Fundamentals of solar electric systems, including photovoltaic, wind, solar thermal power towers, ocean thermal electric and hydrogen producing systems, hydroelectric and geothermal systems. In laboratory, the student will have hands on training with simple solar powered devices and systems, will measure and test performance and possibly take part in light construction.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

T-Elc 107-C—Electricity I: Introduction to basic theories and principles of electricity. Electrostatics, basic electrical units, symbols, Ohm's Law, basic DC circuits, power, DC sources, transients, and simple electrical measuring devices are part of the course. Practical applications are stressed.

Course Hours Per Week: Class 4, M. Lab 3. Quarter Hours Credit 6.
Prerequisite: None

T-Elc 108—Electricity II: A continuation of T-Elc 107-C. Introduction to magnetism, alternation current theory, sine wave analysis, inductance, capacitance, reactance, phase relationships, power, and transformers. Simple generators and distribution systems are studied. Practical applications are stressed with emphasis on regulations, codes, and industry practices.

Course Hours Per Week: Class 4, M. Lab 3. Quarter Hours Credit 5.
Prerequisite: T-Elc 107

T-Elc 109—Electricity III: A continuation of T-Elc 108. Introduction to complex RCL circuits, resonance, filters and multiphase power. Practical applications are stressed.

Course Hours Per Week: Class 4, M. Lab 3. Quarter Hours Credit 5.
Prerequisite: T-Elc 108

T-Elc 110—Electronic and Instrumentation Schematic Reading: A study of schematic and blueprint interpretation. The relationship between the schematic and actual equipment will be studied and practiced. The use and format of instruction manuals pertaining to electronics and instrumentation will be stressed.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Elc 112—Industrial Electricity I: This course introduces the fundamentals of electricity as they apply to industrial application. It covers AC and DC machinery and equipment, and wiring procedures.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Elc 113—Industrial Electricity II: This course further develops the fundamentals of electrical theory, considerable time is spent on wiring procedures for electrical control systems and on trouble-shooting these systems.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Elc 112

T-Elc 202—Industrial Electricity III: This course introduces the principles of electronics as they apply to industry. Subjects covered are: electronic principles, test equipment, components, and logic circuits.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Elc 113

T-Elc 203—Industrial Electricity IV: This course combines electrical and electronic theories as they apply to power supplies, amplifiers, oscillation, filters, and chokes. Also included are practical applications in grounding and handling ungrounded systems.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Elc 202

T-Elc 204—Industrial Electricity V: This course covers practical control equipment trouble-shooting. Considerable time will be given to wiring and trouble-shooting electrical systems.

Course Hours Per Week: Lab 4. Quarter Hours Credit 2.
Prerequisite: T-Elc 203

T-Eln 102—Electronic Navaid Systems: A study of long and short range navigation equipment and systems, i.e., theory of operation, installation and maintenance.

Course Hours Per Week: Class 3, Lab 6. Quarter Hours Credit 6.
Prerequisite: None

T-Eln 103—Small Craft Electronics and Electrical Systems: A study of general electronic and electrical systems employed aboard pleasure craft and fishing fleets; i.e., Loran, R.D.F., fish finders, communication equipment and small craft electrical power systems.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Eln 104—Shipboard Electro-Mechanical Systems: A study of power generation and regulation; motors, generators and MG sets and emergency systems. Pneumatic and hydraulic principles, winches and hoists. Servo systems, electric and hydraulic.

Course Hours Per Week: Class 2, Lab 4. Quarter Hours Credit 4.
Prerequisite: None

T-Eln 106—Electronics I: (Instrument familiarization): Functional use of the various test instruments used in the Electronics and Instrumentation fields.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: None

T-Eln 107—Electronics II (Semiconductor Diodes and Vacuum Tubes): A study of semiconductor diodes, including tunnel diodes, zener diodes, and light emitting diodes.

Course Hours Per Week: Class 5, M. Lab 6. Quarter Hours Credit 7.
Prerequisites: T-Elc 107, T-Eln 106

T-Eln 108—Electronics III (Transistors): Theory and Applications of Transistor Circuits, Biasing, class of amplifiers, oscillators, multi-vibrators, coupling, push-pull and push-push amplifiers, and miscellaneous applications will be studied. Continued study of transducer theory and application.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: T-Eln 107

T-Eln 109—Electronics IV: A continuation of T-Eln 108. Theory and application of silicon controlled rectifiers, (SCR's) triacs, diacs, field effort transistors (FET's) and operational amplifiers.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: T-Eln 108

T-Eln 110—Electronics & Instrumentation Laboratory Practices: Proper use and care of tools and instruments used in electronic and instrument shops will be stressed. Techniques of soldering and unsoldering components and printed circuit board repair will be practiced.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Eln 111—Industrial Instrumentation I: This course establishes the student in the basic principles of using instruments for measuring and controlling industrial processes. These principles are applied to two specific instruments; automatic control valves and pressure gauges.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: None

T-Eln 112—Industrial Instrumentation II: A continuation of Industrial Instrumentation I in which the following topics are covered: pressure fundamentals, manometers, calibration principles, pneumatic instrument principles, pneumatic recorder calibration, pneumatic force moment balance and pneumatic valve positioners.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Eln 111

T-Eln 140—Introduction to Marine Electronics: A continuation of T-Elc 108 with emphasis on marine related applications. Introduction to radar, sonar, communications, sound and electromagnetic wave propogation. Common types of equipment, circuits, testing and measuring devices are studied. Basic introduction to simple electronics. Practical applications are stressed.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: T-Elc 108

T-Eln 205—Applications of Vacuum Tubes and Transistors: Practical applications of vacuum tubes and transistors to basic audio amplifiers, radio frequency amplifiers, detectors, modulators and oscillators.

Course Hours Per Week: Class 4, M. Lab 3. Quarter Hours Credit 5.
Prerequisites: T-Eln 107, T-Eln 109

T-Eln 206—Industrial Instrumentation III: A continuation of Industrial Instrumentation I in which the following subjects are covered: electronic instrument principles, Taylor calibration, electronic recorders, transmitters and valve positioners, temperature measuring principles, equipmentation and calibration.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Eln 111

T-Eln 207—Industrial Instrumentation IV: A continuation of Industrial Instrumentation I in which the following subjects are covered: level measurement fundamentals and level transmitter calibration, flow measurement fundamentals and equipment calibration.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Eln 111

T-Eln 208—Industrial Instrumentation V: This course develops the concept of instrument loops—a combination of components working together. In it will be studied the following subjects: control principles, control diagrams, control loop calibration, automatic control, cascade control, alarms and installation techniques.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Eln 207

T-Eln 213—Pulse Circuit Analysis: The study of wave-shaping circuits and their applications with emphasis on computer usage.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 114

T-Eln 220—Electronic Systems: A block diagram course investigating numerous electronic systems. Modules or blocks of various circuits already studied are arranged in various manners to produce complex electronic systems. Systems will be explained and

reduced to functions and then to block diagrams. AM, FM, and Single sideband ransmitters and receivers, multiplexing, TV transmitters and receivers, pulse-nodulated systems, computers, telemetry, navigational systems, sonar and radar will e considered.

Course Hours Per Week: Class 6. Quarter Hours Credit 6.
Prerequisite: T-Eln 205

T-Eln 224—**Measurement and Control I:** Familiarization of instruments utilized in ndustrial applications. Theory and applications of pressure gauges, vacuum gauges, nanometers, dead weight testers, current calibrators and associated hardware and oftware as applied in industrial applications.

Course Hours Per Week: Class 5, M. Lab 12. Quarter Hours Credit 9.
Prerequisites: T-Eln 109, T-Elc 110

T-Eln 225—**Measurement and Control II:** A study of control theory utilizing lectronic and pneumatic instruments. Control loops, electronic and pneumatic, will be tudied, constructed, and calibrated for actual "in service" conditions.

Course Hours Per Week: Class 2, M. Lab 12. Quarter Hours Credit 6.
Prerequisite: T-Eln 224

T-Eln 226-C—**Measurement and Control III:** Continuation of T-Eln 225 with mphasis on current techniques in industrial instrumentation, instrument installations, nd environmental condition affecting industrial applications of automated systems. Environmental control utilizing electronic and pneumatic systems will be studied.

Course Hours Per Week: Class 5, M. Lab 15. Quarter Hours Credit 10.
Prerequisite: T-Eln 225

T-Eln 229—**Electronic Project:** Construction, wiring and testing of functional lectronic equipment. Develops wiring and trouble-shooting techniques. Selection to be pproved by instructor.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisites: T-Eln 109, T-Elc 109

T-Eln 230—**Electronic Project:** Continuation of project T-Eln 229.

Course Hours Per Week: Class 4, M. Lab 12. Quarter Hours Credit 8.
Prerequisite: T-Eln 229

T-Eln 231—**Electronic Project:** Advanced continuation of T-Eln 230.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: T-Eln 230

T-Eln 232—**F.C.C. License Preparation I (Laws and Regulations):** A study of F.C.C. laws and regulations pertaining to the field of communications.

Course Hours Per Week: Class 4. Quarter Hours Credit 4.
Prerequisite: None

T-Eln 233—**F.C.C. License Preparation II:** A study of various circuit configurations and theory of radios and transmitters as required for F.C.C. 2nd and 1st lass license.

Course Hours Per Week: Class 6. Quarter Hours Credit 6.
Prerequisite: T-Eln 232

T-Eln 236—**Electronics-Instrumentation Field Trips:** Field trips to local industries. Lectures by instrument technicians and engineers.

Course Hours Per Week: Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Eln 238—Antenna and Transmission Line Theory: A study of antenna and transmission line theory. Methods of transferring radio frequency energy from its source to the antenna, antenna theory and radio wave propagation characteristics will be studied.

Course Hours Per Week: Class 2. Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Mat 113

T-Eln 241—Digital Principles & Applications: Basic computer concepts including: Binary and Octal numbers, binary codes, boolean algebra, arithmetic circuits, logic gates, flip-flops, input-out devices, memory devices, D/A and A/D converters.

Course Hours Per Week: Class 4, M. Lab 6. Quarter Hours Credit 6.
Prerequisites: T-Eln 213, T-Elc 109

T-Eln 241-C—Digital Principles and Applications: Basic computer concepts including: Binary and Octal numbers, binary codes, Boolean algebra, arithmetic circuits, logic gates, flip-flops, input-out devices, memory devices, D/A and A/D converters.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: All first year Electronics Technology and Instrumentation Technology Courses.

T-Eng 101—Grammar: This course is designed as a review of the elements of grammar. Exercises involve parts of speech, sentences, punctuation, mechanics, usage and style, spelling, and composition.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Eng 101-C—Grammar and Composition: This course is designed to provide the fundamentals of grammar necessary for written English. Exercises involve parts of speech, larger sentence elements, mechanics, punctuation, and composition.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Eng 102—Composition: This course is designed to orient students in using a library, learning to use the dictionary, and preparing the term paper. Attention is given to acquaintanceship with magazines and other publications. Practice is given in writing compositions of one to five paragraphs emphasizing the topic sentence, expository and argumentative techniques, and transitional expressions.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Eng 101

T-Eng 102-C—Grammar and Composition: In this continuation of T-Eng 101-C, emphasis is placed on advanced grammar and diction and the application of these in compositional work culminating in a term paper. Practice is given in the topic sentence and in organizing and writing compositions of one to five paragraphs.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Eng 101-C

T-Eng 103—Report Writing: The fundamentals of English are utilized as background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must relate to the student's specific curriculum.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Eng 104—Reading and Composition: Advances the student's compositional skills

learned in T-Eng 102-C—Grammar and Composition—by combining them with reading. Included are an evaluative unit (fact, opinions, inferences, etc.), a vocabulary/reading unit, and a unit on literature.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisites: T-Eng 102 or 102-C

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate. This course places emphasis on improving diction, pronunciation, voice, and speaking habits to produce effective oral presentation. Content includes student involvement in interviews, in videotaping, and in various types of speeches such as the impromptu speech and the speech to persuade.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Eng 206—Business Communications: Develops skills in techniques of writing business communications. Emphasis is placed on writing action in such situations as sales applications, orders, letters involving credit, collections, adjustments, and inquiry.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Fip 110—General Insurance: A fundamental course covering all fields of insurance. The philosophy and principles of insurance, contracts, endorsements, assignments, rate charging, reserves, and state supervision. Fire and casualty insurance is emphasized.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Fip 201—Individual Life Insurance: This course lays the economic and ethical foundation on which the life and health insurance business is based. It also familiarizes students with basic individual life, health and annuity contracts available to meet the needs of the insurance buying public.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Fip 247—Business Insurance: An investigation of fundamentals of risk and its application with particular emphasis upon the exposures faced by the consumer and the insurance techniques to cope with the exposures. Offered to the individual who will be a purchaser of insurance and as an introductory course to those who might want further study in insurance preliminary to employment.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Geo 101—Marine Geology: The study and identification of minerals and other physical features of the ocean floor. This course will include the identification of rocks and other mineral samples obtained from the ocean bottom. The physical characteristics of the ocean floor will be studied in depth.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Hea 109—Medical Ethics, Law and Economics: A study of the principles and practices followed by the medical profession in the establishment and operation of a medical facility for the public at large.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Hea 110—Clinical Practice: A course designed to give the student an overview of the medical assistant's duties at the clinical level. Topics covered will include pharmacology, medical instruments, assisting with physical therapy and minor

surgery.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Hed 120—First Aid: This course will teach the students First Aid to enable them to successfully cope with the every day injuries and accidents. Course coverage will range from minor cuts and burns to the treatment of shock. The course will also include what to do in case of injury by dangerous and poisonous marine organisms.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

T-Hed 121—Emergency Medical Technician: This course will teach the students Emergency Medical Training to enable them to successfully cope with the everyday injuries and accidents. Course coverage will range from minor cuts and burns to the treatment of shock.

Course Hours Per Week: Class 5, M. Lab 4. Quarter Hours Credit 5.
Prerequisite: None

T-Ins 201—Economic Security and Individual Life Insurance: This course covers discussion and study of life insurance as it relates to the economic and social environment. Emphasis is placed on a comprehensive grasp of the fields of knowledge to which life insurance is related.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Isc 113—Industrial Safety: This course studies fundamental safety philosophy, and applies it to situations encountered routinely by industrial plant mechanics. The topics to be covered are entering piping systems, routine electrical maintenance, electrical hot work, and electrical test equipment. The student will learn to use safe methods and procedures for accomplishing them.

Course Hours Per Week: Class 1. Quarter Hours Credit 1.
Prerequisite: None

T-Isc 120—Principles of Industrial Management: A study in depth of the organizational and functional aspects of line and linestaff organizations with emphasis on relationships, delegation of authority and assigned responsibilities. Specific emphasis is placed on line—staff relationships, functional authority, methods of control, problem solving, and the establishment of management goals and controls. Each student will be required to develop an organizational structure (under a single manager concept) for a hypothetical business of their choosing.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Isc 210—Job Analysis and Evaluation: This study is based on product studies as well as personnel and wage programs. The course utilizes the study of product design, value analysis, materials and processes as an intricate part of productive procedures.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Isc 211—Work Measurement: This course is designed to give the student a broad concept of Work Measurement as a management tool. It includes a study of the development of standard data from the use of stop watch standards, machine data, and the use of elemental time data. (MTM will be used as a demonstration of this type of data). Methods and techniques requiring the use of flow and process charts, work sampling, flow diagrams, and operation charts will be afforded the student under work conditions.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Isc 268—Purchasing and Materials Management: This course is designed to explore the industrial purchasing cycle for material acquisition and management, i.e., requirement determination, the procurement decision, the procurement process, and materials management. The course will focus on the inter-relationships of procurement with the rest of the functional and system areas of the firm with particular emphasis on the interface with marketing. Products purchased for resale and fashion buying are excluded; concentration is on the manufacturing and institution entities.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Isc 302—Quality Control: Principles and techniques of quality control and cost saving. Organization and procedure for efficient quality control. Functions, responsibilities, structure, costs, reports, records, personnel and vendor-customer relationships in quality control. Sampling inspections, process control and tests for significance.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisites: High School Algebra and Geometry

T-Mat 102—Technical Mathematics: A continuation of T-Mat 101. Advanced algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binomial expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 101

T-Mat 103—Technical Mathematics: The fundamental concepts of analytical geometry, differential and integral calculus are introduced. Topics included are graphing techniques, geometric and algebraic interpretation of the derivatives, differentials, rate of change, the integral and basic integration techniques. Application of these concepts to practical situations is stressed.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 102

T-Mat 104—Basic Mathematics: A general review of arithmetic with emphasis on decimals, fractions and percent. A thorough coverage of ratio and proportion.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Mat 105—Basic Mathematics: The application of simple algebra to the solving of practical problems is the main objective of this course. The student will learn to use mathematical tables and how to construct and read graphs. Use of conversion factors and scientific notation will be used throughout the course.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 104

T-Mat 107—Industrial Calculations: This course is designed to provide review, practice and applications of the mathematical techniques required to solve chemical problems effectively. The entire emphasis of the course will be on solving problems involving applications of specific formulas and methods encountered in the field of chemistry.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 122

T-Mat 110—Business Mathematics: The fundamental mathematical operations and their application to business problems. Topics covered include the fundamentals of problem solving, computing with whole numbers and decimals, common and complex fractions, percentage, and interest.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Mat 111—Applied Mathematics for Electronics: Designed to aid the student by mathematical applications of the basic theories and principles of electricity. Scientific notation, units and dimensions, and Ohm's Law regarding series and parallel DC circuits are studied. The slide rule will be utilized in this course; calculators **will not** be used.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None.

T-Mat 112—Applied Mathematics for Electronics: This is a continuation of T-Mat 111. Mathematical applications are made to the study of resistivity, alternating currents, induction, reactance, impedance, phase relations, and transformers.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 111

T-Mat 113—Applied Mathematics for Electronics: This is a continuation of T-Mat 112. Mathematical applications are made to the study of capacitance, complex RCL circuits, resonance, filters and multiphase power.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 112

T-Mat 114—Applied Mathematics for Electronics: A continuation of T-Mat 113. This course deals with Boolean Algebra as applied to digital logic and control devices. The laws and principles of Boolean Algebra will be studied in detail. Kavnaugh mapping and the binary number system will be examined.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 113.

T-Mat 121—Technical Mathematics: The general area of basic mathematical concepts is presented, including common and decimal fractions, squares and square roots. The essential elements of algebra are also presented, including: positive and negative numbers, algebraic terminology, polynomials, exponents, scientific notation and powers of 10, grouping symbols, first degree and literal equations. The application of principles learned is stressed in practical problems.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Mat 122—Technical Mathematics: This is a continuation of T-Mat 121. Numerical trigonometry is introduced in this course and includes right triangles and radian measure of angles. A working knowledge of numerical computations is acquired, utilizing logarithms. Linear graphs, simultaneous equations and determinants are also introduced.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 121

T-Mat 123—Technical Mathematics: This is a continuation of T-Mat 122. More advanced algebraic subjects are presented, including: Special products, factoring, algebraic fractions, exponents and radicals, vector and phasor algebra, quadratic equations, graphs of quadratics, maximum and minimum, and imaginary numbers. Measurements and computations involving areas and volumes of regular figures and solids are introduced as well as trigonometric functions of oblique triangles.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 122

T-Mat 126—Hand Calculator Operations: This course is designed to acquaint the student with the operation of hand calculators. Calculators will be used for basic arithmetical computations, powers and roots, logarithmic and trigonometric functions. Practical applications will be stressed in the calculations.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Mat 122

T-Mat 130—Advanced Business Mathematics: A study of pertinent uses of mathematics in the field of business. Topics covered include payrolls, price marking, depreciation, distribution of profits, compound interest, and amortization.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 110

T-Mat 201—Technical Mathematics: A continuation of T-Mat 103. More advanced concepts of differentiation and integration are considered. Included are graphs and derivatives of the trigonometric functions, exponential and logarithmic differentation and integration, advanced integration techniques, polar equations, parametric equations and Fourier series.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 103

T-Mat 208—Precalculus Mathematics: This course is designed to provide a basic foundation for a beginning course in calculus. Material covered will provide a rigorous examination of algebraic and trigonometric relationships with extensive work in analytic geometry.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 123

T-Mat 209—Introduction to Calculus: T-Mat 209 is a beginning course in calculus. Topics include the concept and application of the limit, series, the derivative, and the integral. Emphasis is placed on the practical aspects of the differentiation and integration of simple algebraic and trancendental functions.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 208

T-Mat 211—Basic Statistics: The student is introduced to the terminology and mathematical notation of statistics. Topics of discussion include the description of numeric distributions (graph, mean, variance, and standard deviation, and probability).

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 123

T-Mat 215—Fundamentals of Conversion to Metric System: Introduction to basic units of measure: length (meter), mass (gram), volume (liter). Practical application in everyday and scientific use.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Mat 221—Technical Mathematics: A continuation of T-Mat 123. Advanced algebraic operations are introduced, including a study of equations and trigonometric functions. Selected areas of analytic geometry are studied involving graphic interpretation of functional relationships. The course is designed primarily to provide the student with a stronger foundation for more advanced courses in mathematics.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 123

T-Mec 101—Machine Processes: An introductory course designed to acquaint the student with basic hand tools, safety procedures and machine processes of modern

industry. It will include a study of measuring instruments, characteristics of metals and cutting tools. The student will become familiar with the lathe family of machine tools by performing selected operations such as turning, facing, threading, drilling, boring, and reaming.

Course Hours Per Week: Lab 4. Quarter Hours Credit 2.
Prerequisite: None

T-Mec 102—Machine Processes: Advanced operations on lathe, drilling, boring and reaming machines. Milling machine theory and practice. Thorough study of the types of milling machines, cutters, jig and fixture devices, and the accessories used in a modern industrial plant. Safety in the operational shop is stressed.

Course Hours Per Week: Lab 4. Quarter Hours Credit 2.
Prerequisite: T-Mec 101

T-Mec 107—Process Instrumentation: This is a lecture course to introduce the student to the theory and operational principles of industrial process instruments.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Mec 108—Process Instrumentation: This is a continuation of the course T-Mec 107 with the addition of laboratory experience in the calibration and operation of various industrial instruments.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: T-Mec 107

T-Mec 111—Industrial Mechanics I: Major areas covered by this course are tools, fasteners, and engineering drawings. Proper care and use of hand tools, power tools, and precision measuring tools are stressed with special emphasis on hand safety and tool hazards. Reading and interpretation of engineering drawings and sketches are a vital part of this course. Instruction in the selection and installation of fasteners is also important in establishing a broad base of mechanical knowledge.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: None

T-Mec 112—Industrial Mechanics II: This diversified course covers many aspects of an individual mechanic's job; rigging, equipment alignment, and bearings. Geometric relationships and basic math are essential parts of this course. Lubrication types and methods of application are included in the study of bearings. A practical approach to rigging is used to teach students how to move heavy equipment with a variety of slings, hoists, and jacks.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Mec 111

T-Mec 113—Industrial Mechanics III: The subject matter of this course is varied in nature and is intended for the advanced student. Topics to be covered are basic engineering materials, flexible hoses and fittings, and free hand sketching. Physical properties and characteristics of structural steel will be examined along with the properties of some other engineering materials available in industry today.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

T-Mec 115—Industrial Pipefitting I: This course is an introduction to pipefitting with emphasis on fabrication and installation of threaded pipe. Topics covered are piping materials and tools, threaded pipe fabrication and installation, conduit fabrication and installation, gaskets and packing. Proper use of hand and power tools will be practiced during all phases of this course. Students will fabricate different pipe and conduit sections based on their own field measurements.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: None

T-Mec 116—Industrial Pipefitting II: This course will teach the industrial mechanic to maintain and repair existing piping systems. The mechanic must be able to identify defective parts of a pipe system, choose suitable replacement parts, shutdown the energized system, and repair it. These systems could be flanged, threaded, or soldered. A working knowledge of system components such as; valves, traps, strainers, filters, and relief valves will be achieved.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: T-Mec 115

T-Mec 205—Strength of Materials: Introduction to the principles and analysis of stresses which occur within machine and structure elements subjected to various types of loads such as static, impact, varying and dynamic. Discussions of these stresses are made as applied to thin-walled cylinders and spheres, riveted and welded joints, beams, columns and machine components.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisites: T-Phy 106, T-Mat 123

T-Mec 209-C—Introduction to Metallurgy: An introductory course investigating the properties of ferrous and non-ferrous metals and the tests to determine their uses. Production of iron and steel, shaping and forming, physical metallurgy of ferrous metals, heat treatments of steel, surface treatments, alloys of steel, and cast iron will be topics for study. Non-ferrous metals such as bearing metals (lead, brass, bronze), light metals (aluminum and magnesium), copper and its alloys will be studied.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Mec 215—Metallurgy: This course introduces the student to the physical properties and characteristics of various ferrous and nonferrous metals and their alloys and methods used to change those properties and characteristics to better serve industrial purposes. Other topics will include destructive and nondestructive tests, atmospheric tests, and chemical qualitative analysis of selected specimens.

Course Hours Per Week: Class 3, Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Mec 216—Industrial Materials: Proper knowledge of all types of industrial materials is essential to successful decision-making and problem solving. This introductory course investigates the basic materials in industry. Electrical and physical properties of materials, mechanical characteristics of materials, water and steam, industrial gases, ceramic materials, cements and concretes, and metals are studied.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Mec 217—Industrial Mechanics IV: The subjects covered are scaffold erection and use, and ladder use and inspection. Both safeway and tubelox scaffold erection procedures along with inspection and safety will be taught. Proper use and careful inspection of ladders is an important part of scaffold erection and will also be covered.

Course Hours Per Week: Lab 2. Quarter Hours Credit 1.
Prerequisite: None

T-Mec 218—Industrial Pipefitting III: This is a continuation of Industrial Pipefitting II. Basic pipe rigging procedures and installation of pipe hangers will benefit those students working with large diameter piping systems. Other topics to be covered are vacuum jets, sightglasses, relief valve maintenance, PVC piping, and hydraulic piping systems.

Course Hours Per Week: Class 2, Lab 4. Quarter Hours Credit 4.
Prerequisite: T-Mec 116

T-Mec 219—Industrial Equipment Maintenance I: This course covers maintenance and overhaul aspects of industrial equipment. Covered in this course are

techniques of repair, installation, and maintenance of mechanical seals, bearings, and industrial pumps.

Course Hours Per Week: Class 2, Lab 4. Quarter Hours Credit 4.
Prerequisite: None

T-Mec 220—Industrial Equipment Maintenance II: This course further develops pump overhaul.

Course Hours Per Week: Lab 2. Quarter Hours Credit 1.
Prerequisite: T-Mec 219

T-Mec 221—Industrial Equipment Maintenance III: Covered in this course are installation and maintenance techniques for roller chain and sprockets, vee belts and sheaves. Maintenance and overhaul of gear boxes and speed changers is covered.

Course Hours Per Week: Class 4, Lab 4. Quarter Hours Credit 6.
Prerequisite: T-Mec 219

T-Mec 235-C—Hydraulics and Pneumatics: In this course the student will learn the basic ideas of hydraulic and pneumatic systems. In so doing the student will develop an understanding of various hydraulic and pneumatic controls and their relationships and function in circuits. Symbols and conventional practices will be stressed.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisites: T-Phy 102 or T-Phy 105

T-Mec 240—Radiographic Testing: A survey of the principles governing the radiographic testing process and the type of parts commonly inspected with radiation; routine procedures used in accomplishing the test, understanding the requirement for a specific technique, and safety precautions pertinent to radiation hazards will be stressed.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Mec 244—Liquid Penetrant Method: A survey of liquid penetrant process used in manufacturing, inspection and testing procedures.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Mec 247—Magnetic Particle Testing: An introduction to the principles governing the magnetic particle testing and inspection process. Identifies types of parts which are commonly tested by magnetic lines of force. Explores advantages and disadvantages. Explores surface and subsurface indications.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Mec 248—Ultrasonic Testing: Principles of ultrasonic testing and inspection process covers type of parts commonly tested with ultrasonics. Procedures for specific test, advantages and disadvantages.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Met 101—Introduction to Meteorology: This course will include study of the composition of the atmosphere and the physical forces that influence weather, also the identification of and interpretation of weather phenomena and patterns from weather data.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Mgt 104—The Art of Motivating People: This class will examine some theories,

discuss important questions and provide guidepost for motivating others.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

T-Msc 100-C—Small Boat Handling: A practical course in the operation and handling of small boats. Includes a comprehensive study of safety on the water. Students will launch, pilot and recover a small boat and be instructed on trailering small boats on the highway. Students will themselves maintain boats and their engines.

Course Hours Per Week: Shop 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 101—Navigation I: This course is designed to prepare the student to apply the basic marine piloting techniques using the proper equipment including various type charts and the symbols thereon, navigational aids, buoys, markers, rules of the road, light and signals. The principle and operation of the magnetic compass and its application to marine piloting, shipboard procedures, and practical marine piloting is stressed.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 102—Navigation II: A continuation of T-Msc 101 and the practical application of shipboard piloting procedures, navigational publications and electronic navigational aids being stressed. The use of electronic equipment; radar, radio direction finding, loran, sonic echo ranging and recording, the gyro compass, etc. to extend marine piloting is introduced. Classroom instructions in tides, tidal current effects, danger angles and soundings and practical applications thereof are included.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Msc 101

T-Msc 105—Shipboard Orientation and Basic Seamanship: An introduction to ships and requirements of shipboard life. Shipboard nomenclature, ship construction and water, fuel, heating, air and propulsion systems will be studied. Safety at sea will be stressed and fire, man overboard, and abandon ship drills will be practiced. Students will receive practical instruction in rules of the road, small boat handling and marlinespike seamanship.

Course Hours Per Week: Lab 2. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 106—Basic Navigation: Theory of navigation with a study of the compass, compass error, and its applications, various types of charts, plotting, piloting, navigation aids, buoys, lights and ocean currents. Theory and practical application of ship board procedures and seamanship.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 107—Introduction to Oceanography: A general description of the oceans, their geography, geology, chemistry and physics. A survey of terminology and techniques used by scientists in studying the oceans.

Course Hours Per Week: Class 3. Quarter Hours Credit, 3.
Prerequisite: None

T-Msc 108—Oceanographic Instrumentation: Classical Oceanographic Instrumentation is introduced via demonstration and student operation. Emphasis will be placed on use, maintenance and repair of routine survey instruments.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 111—Introduction to Net Construction and Repair: T-Msc 111 will

introduce the students to all types of fish catching methods available to the commercial and scientific fisherman. An instruction on basic aspects of rigging, rope splicing, various practical knots and various hardware used in fishing operations. Students will make periodic trips to various locations where commercial and scientific operations take place.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 112—Fishing Gear Construction: During this quarter students will be instructed in the construction of various types of nets and traps, i.e., pound net, fyke net, lobster pots, fish and crab pots, gill nets, and various trawls and dredges.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 113—Fishing Methods I: During this quarter the student will be instructed in the use of the various types of gear that vessels and weather conditions permit. Gear will be of the elementary type; crab pot, fish pots, gill net, and dredges as time permits.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 114—Fishing Methods: The students will be instructed in the use of the various types of gear that vessels and weather conditions permit. Gear will be of the more sophisticated type; pound nets, fyke nets, lobster pots, various trawls, and larger specialized dredges.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: T-Msc 113

T-Msc 117—Practical Experience I: This course will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 118—Practical Experience II: This course will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 119—Practical Experience III: This course will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

T-Msc 121, 122, 123, 124, 125, 126, 127, 128—Ship and Marine Equipment Repair: These courses will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 129—Power Boat Operations: This course is designed to indoctrinate the student in the various aspects of safe, skillful, and seamanlike operations of varying types and sizes of power boats under differing kinds of wind, weather, current and sea condition. Emphasis is placed on nautical terminology, boat nomenclature, boating equipment, and marlinspike seamanship. Students will launch, operate, and recover power boats, and receive instruction in highway trailering of boats.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 130—Oceanography and Oceanographic Instrumentation: A general description of the ocean, its geologic features, its chemical composition, its plant and animal life, and its physical characteristics. An introduction to oceanographic survey techniques and oceanographic instrumentation with emphasis on water quality instrumentation. Students will receive practical experience in set up, operation, maintenance and trouble-shooting of instrumentation in the shop and aboard ship.

Course Hours Per Week: Class 2, Lab 6. Quarter Hours Credit 5.
Prerequisite: None

T-Msc 139-C—Introduction to Marine Construction: This course will include an introduction to rigging, its components and terminology, basic information about the types of materials and equipment used in marine construction. Course also includes basic and preventative maintenance as well as surveying and blueprint reading.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 140—Marine Construction Equipment I: A course introducing the student to the operation, maintenance, and repair of the mechanical, electrical, and internal combustion equipment normally used in the marine construction field. Of particular interest to the student is the care and maintenance of the various gasoline and diesel engines used to operate pumps, compressors, lighting systems, and generators. Operation and maintenance of pumps and hydraulic systems is also part of this course.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Msc 141—Marine Construction Equipment II: A continuation of T-Msc 140 with an introduction to the various pumping systems used on marine construction "rigs." Auxiliary equipment such as generators and lighting equipment will also be discussed. Hydraulics and compressors are covered in detail.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: T-Msc 140

T-Msc 147—Work Practice: Intermediate work experience assisting journeymen on marine construction projects such as power plants, bridges, sea walls, jettys, bulkheads, oil terminals, pier and dock facilities, artificial reefs and islands, shipyards, marinas, dams, sewage plants, fish farms, and dredging. When evidence is presented to the Director of Engineering Division that jobs are not available, this course shall be waivered.

Prerequisite: None

T-Msc 148—Marine-Cooperating Outside Agencies: Guest speakers in fields related to management policies shall be invited to discuss their fields of expertise, i.e., Corps of Engineers, Bank Trustees, National Labor Relations Board, etc.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 149—Marine Construction Techniques: During the sixth quarter, the second year student will put to practical use what he has learned in the classroom. The student will discuss a project with his instructors, do the "lay-out," estimate the materials and equipment needed and proceed as if it were a regular engineering contract. It is anticipated that for at least 4-5 years these projects will consist of dredging, bulkhead construction, pier building, etc., on the riverfront section of the school's campus.

Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisite: None

T-Msc 150—Marine Equipment Operation I: Among the more important duties of the construction technician is assuring that the various equipment used in the operation is in a state of readiness. Much valuable time and money is lost by a firm which experiences breakdown of its equipment. Emphasis is placed upon the importance of a comprehensive and calculated maintenance program. The technician will also from time to time be called upon to operate a piece of equipment to teach an employee or to "fill in" in the event of the absence of an operator. The student completing this course will have a working knowledge of most equipment used in marine construction.

Course Hours Per Week: Class 1, M. Lab 6. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 151—Marine Equipment Operation II: A continuation of Marine Equipment Operation and Maintenance I with emphasis on operation and maintenance of the winches used in marine construction.

Course Hours Per Week: Class 1, M. Lab 6. Quarter Hours Credit 3.
Prerequisite: T-Msc 150

T-Msc 152—Marine Equipment Operation III: A continuation of Marine Equipment Operation and Maintenance II with emphasis on crane operation and maintenance. During this course, the student will have knowledge of the mechanical parts of the crane and how it works. Digging or dredging with the "clam-shell" bucket will also be demonstrated and practiced during this time.

Course Hours Per Week: Class 1, M. Lab 6. Quarter Hours Credit 3.
Prerequisite: T-Msc 151

T-Msc 153—Marine Equipment Operation IV: A continuation of Marine Equipment Operation and Maintenance III with emphasis on the operation and maintenance of the suction dredge. Students will be taught to set-up and pipe material away from the site of dredging operation during this period.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: T-Msc 152

T-Msc 154—Marine Equipment Operation and Maintenance V: A continuation of Marine Equipment Operation and Maintenance IV with emphasis on the pumps, air compressors, and generators used in marine construction programs.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: T-Msc 153

T-Msc 155—Marine Equipment Operation VI: A continuation of Marine Equipment Operation and Maintenance V and review of all the equipment studied thus far.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: T-Msc 154

T-Msc 202—Introduction to Data Acquisition: Introduction to the handling of oceanographic data. Temperature and salinity data will be used to demonstrate standard methods of recording and reducing oceanographic data in this sequential course.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

T-Msc 204—Advanced Oceanographic Instrumentation: Practical oceanographic shop and small craft training combining the use of hand tools with the design, construction, testing, calibration, maintenance, repair and installation of specialized equipment used in general oceanography and limnology.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 205—Data Reduction Techniques: This course is a continuation of T-Msc 202

and will emphasize many standard techniques essential to the collection, handling, reduction, and display of oceanographic temperature and salinity data for dynamic purposes.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: T-Msc 202

T-Msc 216—Oceanographic Data Processing: Data acquisition and reduction with stress being placed on the conversion of raw field data to usable laboratory data.

Course Hours Per Week: Class 2, Lab 4. Quarter Hours Credit 4.
Prerequisite: None

T-Msc 218—Eddy Current Testing: Principles of eddy current testing and inspection process. Emphasis on routine procedures involved; selection of a specific technique; limitations, advantages and disadvantages of this test. Interpreting frequency meter indication.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

T-Msc 220—Practical Experience IV: This course will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: Lab 2, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Msc 221—Practical Experience V: This course will be offered to provide practical experience in trade and technical marine fields specifically related to the needs of graduates based on continuing surveys of marine industry.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Msc 224—Chemical Oceanographic Sampling: Combines emphasis upon the fundamentals of lab procedure and the operation, maintenance, and calibration of chemical instrumentation used in typical oceanographic and limnological surveys.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: T-Chm 109

T-Pho 110—Introduction to Photography: T-Pho 110 will introduce the basic skills of black and white photography. The workings of the camera will be explained. What makes a good photograph and how to take a good photograph will be covered. Instruction will also be given on how to process film, to make good prints, and to prepare photographs for display.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Pho 210—Advanced Photography: This course will go into greater detail of black and white photography, basics of underwater photography, and introduction to color slide developing.

Course Hours Per Week: Class 1, Lab 3. Quarter Hours Credit 2.
Prerequisite: T-Pho 110

T-Phy 100—Basic Physics: A basic course in Introductory Physics. Designed to acquaint the student with common conversion factors and how to use them. The principles of simple machines and mechanics are presented. Measurement and the use of various measuring instruments are investigated.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: None

T-Phy 101—Physics: Properties of Matter: This is a fundamental course which

covers the characteristics of solids, liquids and gases. Specific topics studied are: surface tension, modulus of elasticity, heat and change of state. The laboratories are designed to complement the course by emphasizing units and physical measurements.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Mat 121

T-Phy 102—Physics: Work, Energy, Power: This course is an introduction to the study of motion. Topics included are: forces and their influence on linear motion, work, energy, power, simple machines, and a brief examination of rotary motion. Laboratories are included which are designed to enhance the student's ability to make intuitive judgements about physical systems.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisites: T-Phy 101, T-Mat 121
Co-Requisite: T-Mat 122

T-Phy 102-C—Introductory Physics: This fundamental course forms the prerequisite for T-Phy 102, T-Phy 104-C, T-Phy 105, or T-Phy 106. The student is introduced to the units used in measurements, and to the following concepts applied to linear motion: force, work, and power. Emphasis is placed on the universal applicability of these concepts to other more specialized programs of study.

Course Hour Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: It is recommended that T-Mat 121 be taken prior to enrolling in this course or be taken concurrently with this course.

T-Phy 103—Physics: Electricity: This course is an introduction to electricity and electrostatics with emphasis on the practical phenomena associated with electric currents and magnetism. Topics concerning electrical power production and distribution are included.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisites: T-Mat 122, T-Phy 101 or T-Phy 101-C

T-Phy 104-C—Physics: Light and Sound: Wave motion, sound, light and illumination are studied. Simple optical instruments are analyzed with emphasis given to basic optical principles which determine their construction. Wave optics and some phenomena associated with coherent light are discussed briefly.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisites: T-Mat 123, T-Phy 102-C

T-Phy 105—Heat and Fluids: This course provides a thorough introduction to the physics of both gaseous and liquid fluids at rest as well as an introduction to heat and heat transfer. A brief examination of moving fluids is included for completeness. Emphasis is placed on the practical aspects of heat and heat transfer by moving fluids.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Phy 102-C

T-Phy 106—Applied Mechanics: As an introduction to mechanics, this course is a study of static force systems. The following types are studied: parallel co-planar forces, concurrent co-planar forces, noncurrent co-planar forces, concurrent space forces, centroids, and center of gravity.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisites: T-Mat 123, T-Phy 102-C

T-Phy 225—Forensic Physics: This course is designed to give criminal justice students a fundamental knowledge of the physical principles around which law enforcement equipment is designed. The three principal areas of study are as follows: Power, work, and energy as the basis for projectile motion, electric circuits as the basis for alarm and surveillance equipment, and ray optics as the basis for photographic and surveillance equipment.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: T-Mat 121

T-Pme 101—Marine Engines I: A course introducing the student to basic onstruction of internal combustion engines of the reciprocating types. Hand tools and ower tools, basic maintenance and repair of related equipment including starters, ater pumps, and generators are covered.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Pme 102—Marine Engines II: A continuation of T-Pme 101 covering theory of peration, breakdown and overhaul of small engines, water pumps and accessories, and naintenance on all school inboard and outboard engines.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: T-Pme 101

T-Pme 103—Marine Engines III: A course covering the operating fundamentals of everal models of diesel engines and the basic principles of gas turbine engines. General Motors, Cooper Bessemer and Ford Diesel engines will be utilized as teaching aids.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: T-Pme 102

T-Pme 104—Marine Engines IV: This course is designed to teach trouble-shooting epair and overhaul of outboard, inboard-outboard and small gasoline inboard engines f the reciprocating internal combustion types. The following subjects will be taught: gnition, carburetion, remote control, hookups, alignment, twin and lower units.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

T-Pol 103—State and Local Government: A study of state and local government, tate/federal inter-relationships and the functions and prerogatives of the branches. roblems of administration, legal procedures, law enforcement, police power, taxation, evenues and appropriations are featured. Special attention will be given to North arolina.

ourse Hours Per Week: Class 3. Quarter Hours Credit 3.
rerequisite: None

T-Pol 105—Constitutional Law I: A study of court cases as they relate to onstitutional questions confronted by the law enforcement officer.

ourse Hours Per Week: Class 3. Quarter Hours Credit 3.
rerequisite: None

-Pol 115—Criminal Law I: A study of the criminal law as it relates to the laws efining crimes. The student will learn the present status of criminal law by in-depth udy of legal concepts, the law as written in chapter 14 of the General Statutes and their terpretation by the state and federal courts.

ourse Hours Per Week: Class 3. Quarter Hours Credit 3.
rerequisite: None

-Psy 206-C—Applied Psychology: A study of the principles of psychology that will e of assistance in the understanding of inter-personal relations on the job and in the me. Motivation, feelings and emotions are considered with particular reference to on-e-job problems. Other topics investigated are: employee selection, supervision, job tisfaction, and industrial conflicts. Attention is also given to personal and group namics so that the student may learn to apply the principles of mental hygiene to his djustment problems as a worker and a member of the general community.

ourse Hours Per Week: Class 3. Quarter Hours Credit 3.
rerequisite: None

T-Psy 209—Applied Psychology for Law Enforcement: This course is based on social psychology and how its principles and concepts relate to needs of law enforcement.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Psy 206-C

T-Psy 228—Abnormal Psychology: A comprehensive introduction to pathological behavior including its description, causation, and modification. Emphasis is on environmental and hereditary factors affecting the development and maintenance of various behavioral disorders.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: T-Psy 206-C

T-Rea 101—Fundamentals of Real Estate: This course is designed to prepare the student for the N.C. Real Estate Brokers Examination. Fundamental principles and theories of real estate are covered including terminology, North Carolina's Licensing Law, ethics, and organizational structure.

Course Hours Per Week: Class 6. Quarter Hours Credit 6.
Prerequisite: None

T-Rea 209—Real Estate Finance: A study of real estate finance including an analysis of financial techniques and instruments necessary in real estate financing. Topics include the structure of the mortgage market, the sources of funds, types of mortgages, role of government agencies, interest rates, loan origination and servicing, and competition in the money market.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

T-Rea 221—Real Estate Investment and Taxation: A study of fundamental investment concepts, timing and methods of financing, designed to provide the prospective investor with a guide to successful real estate investment. Emphasis will be placed on investment during the development process, what to buy and how to buy. Other topics to be discussed are how to take title, when to invest in real estate corporations and trusts, tax consequences and the influence of federal and state laws on real estate investments.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Rea 292—Real Estate Appraisal I: A study of the principles and theory of appraising real property. Topics selected include site evaluation, building materials and components, methods of appraising property, and professional organizations.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Rea 293—Real Estate Appraisal II: A study of the methods and techniques used in estimating the value of residential properties and in preparing a residential appraisal report. Topics include analysis of economical factors affecting the value of real estate, local, state, federal and neighborhood influences and attitudes, economical factors and estimation of value.

Course Hours Per Week: Class 2, Lab 3. Quarter Hours Credit 4.
Prerequisite: None

T-Rea 296—Property Management: A study of the nature of property management, types of property, lease preparation, property maintenance and protection of property (Insurance). Other topics include accounting and budgeting in property management, tenant selection, and legal and professional requirements of a property manager.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Shi 101, 102, 103, 104, 105, 106, 107, 108—Ship Experience: All students will receive sea experience aboard the school's vessels during each quarter, the extent and dates to be determined by weather conditions, vessel operational status, and contractual arrangements of chartering scientific agencies. Students will be rotated on various assignments. They should expect to apply theories and practices studied while ashore. Two units of credit will be given for each 60 hours of ship experience or instruction during cruises, or each twelve hours will earn 0.4 credits.

Prerequisite: None

And/or

T-Shi 221, 222, 223, 224, 225, 226, 227, 228—Marine Projects: This special course will be required of all students whenever they cruise less than five days per quarter, to the extent that the combination of marine project days and ship experience days always equals five days. Students will be assigned to one or more instructors and/or ship personnel in this course, who will be required to develop and supervise projects in their respective marine related areas for the days and times indicated, aboard the docked ship or ashore. A marine project day requires six contact hours and earns 0.2 credit. An entire week of marine projects would require 30 contact hours and would earn 1 credit for the student.

Prerequisite: None

T-Soc 102-C—Principles of Sociology: An introductory course in the principles of sociology. An attempt to provide an understanding of culture, collective behavior, community life, social institutions and social change. Presents the scientific study of man's behavior in relation to other men, the general laws affecting the organization of such relationships and the effect of social life on human personality and behavior.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Soc 206-C—American Institutions: A study of the effect of American social, economic, political, religious, and educational institutions upon the individual in his role as a citizen and a worker. The course dwells upon current local, national, and global problems in the light of our political and economic heritage.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Soc 212—Sociology for Deviant Behavior: A study of the deviant personality and approaches to establishing reformative communications. The concept of Transactional Analysis is emphasized and demonstrated as it may be used in interviews, interrogations and counseling.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

T-Wld 101—Welding: Familiarization with the various Welding techniques and processes will be taught. These will include Oxyacetylene Welding, Arc Welding, Mig Welding, and Tig Welding.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Wld 134—Marine Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Metallurgy of welding is discussed. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding and flame cutting. Emphasis on electric arc and gas welding methods applicable to mechanical repair work. Brazing also covered.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

T-Wld 134-C—Marine Welding: Welding demonstrations by the instructor and welding practice by students in the welding shop. The students should become proficient in welding stringer beads from the flat position to the vertical position in the time allotted during the quarter. Safe and correct methods of assembling and operating the welding equipment, the correct use of flame cutting and arc cutting equipment applicable to mechanical repair work.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

T-Wld 135—Marine Welding I: Practice in marine types of welding. This quarter of welding will include the joining of plate, fillet welds, scab patches, lap welds, and the most common repairs made around marine work. Below surface welds will be discussed and procedures will be practiced above the surface so they may be applied below the surface of fresh and salt water.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: T-Wld 134-C

T-Wld 136—Marine Welding II: Underwater Cutting and Welding (Optional): Underwater welding and cutting demonstrations by instructors and limited practice by students. This course is designed to familiarize the students with types of equipment, safety required, efficiency, cost of operations, and to stress the importance of being a qualified welder before taking the task of underwater welding and cutting. Emphasis will be placed on safety because of the hazards using extreme voltage and amperage around, above, and below the surface of fresh and salt water.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisites: T-Wld 134-C, T-Wld 135, and status as a Certified Scuba Diver

TRADE CURRICULA

TRADE CURRICULA

In North Carolina as well as throughout the nation, the demand for skilled tradesmen is at an all-time high. Hardly a day passes that the Institute does not have at least one call from industry looking for prospective employees. Graduates of the trade programs sometimes have as many as four or five offers of employment upon graduation.

Students in the skilled trade programs are trained in shops similar to those of private industries. The shops contain testing and measuring instruments, tools, and equipment of the same size and types as found in private firms. The facilities make possible practical instruction which is essential to the preparation of skilled workers needed by today's modern industries. Students in these trade programs spend twenty-five to thirty hours per week in school; this time is divided between classroom studies and practice shop-work.

Skilled craftsmanship in the occupation, appropriate educational background and leadership ability are the basis for instructor selection in these trade courses.

A diploma or a certificate is awarded to those students who satisfactorily complete the full time trade program. To be eligible for the diploma, a satisfactory passing grade must be maintained in all shop work and related class subjects.

AUTHORIZED PROGRAMS

One year (12 months) training courses are offered in the following skilled trades:

Automotive Mechanics
Boat Building
Commercial Fishing
Drafting, Mechanical
Electronics Servicing
Heating & Air-Conditioning
Industrial Air Conditioning (Specialty)
Industrial Machine Operator (Specialty)
Industrial Electricity
Machine Trades
Marine and Diesel Mechanics
Marine Maintenance and Related Occupations
Operating Room Assistant (9 months)—Offered periodically
Practical Nurse Education
Welding

ADMISSION REQUIREMENTS

1. Must be at least 18 years of age, or his high school class must have graduated.

2. Should be a high school graduate but must have completed at least eight (8) units of high school work—exceptions may be made for more mature adults who have been out of school for some time. Must be a high school graduate or the equivalent* to enter practical nursing program.

3. Must demonstrate aptitude for trade-vocational training as determined by standard tests. These tests will aid in student selection, placement, and guidance. Guidance and counseling will be available to the student throughout his education.

4. Must have sufficient mathematics to make success in the course of study likely.

5. Must complete medical form provided by the Institute.

6. A personal interview is required.

ADMISSION PROCEDURE

1. Submit completed application.

2. Have transcripts of all previous education mailed to the Institute.

3. Must take placement test.

4. Submit medical form to the Institute.

5. Come to the school for a personal interview and additional testing when asked to do so.

6. Complete Residence Status Form.

*See page 178 in General Adult Education Section of this catalogue for details about the high school equivalency certificate.

AUTOMOTIVE MECHANICS

This curriculum provides a training program for developing the basic knowledge and skills needed to inspect, diagnose, repair or adjust automotive vehicles. Manual skills are developed by practical shop-work. Thorough understanding of the operating principles involved in the modern automobile comes in class assignments, discussion, and shop practice.

Complexity in automotive vehicles increases each year because of scientific discovery and new engineering. These changes are reflected not only in passenger vehicles, but also in trucks, buses and a variety of gasoline-powered equipment. This curriculum provides a basis for the student to compare and adapt to new techniques for servicing and repair as vehicles are changed year by year.

Automobile mechanics maintain and repair mechanical, electrical, and body parts of passenger cars, trucks, and buses. In some communities and rural areas they also may service tractors or marine engines and other gasoline-powered equipment. Mechanics inspect and test to determine the cause of faulty operation. They repair or replace defective parts to restore the vehicle or machine to proper operating condition. They use shop manuals and other technical publications.

Automotive mechanics in smaller shops usually are general mechanics qualified to perform a variety of repair jobs. A large number of automobile mechanics specialize in particular types of repair work. For example, some may specialize in repairing only power steering and power brakes, or automatic transmissions. Usually such specialists have an all-round knowledge of automotive repair and may occasionally be called upon to do other types of work.

AUTOMOTIVE MECHANICS

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
PME	1101—Internal Combustion Engines	3	0	15	8
MAT	1101-C—Trade Mathematics	5	0	0	5
ENG	1101-C—Communication Skills	2	0	0	2
PHY	1101—Applied Science	3	2	0	4
		13	2	15	19
SECOND QUARTER					
PME	1102—Engine Electrical and Fuel Systems	5	0	15	10
ENG	1102-C—Communication Skills	2	0	0	2
AUT	1126—Schematics and Diagrams: Automotive	0	0	3	1
PHY	1102—Applied Science	3	2	0	4
		10	2	18	17
THIRD QUARTER					
AUT	1120—Automotive Analysis	2	0	3	3
AUT	1123—Automotive Chassis and Suspension Systems	3	0	9	6
AUT	1121—Braking Systems	3	0	3	4
PSY	1101—Human Relations	3	0	0	3
AHR	1100—Automotive Air Conditioning	1	0	3	2
		12	0	18	18
FOURTH QUARTER					
AUT	1124—Automotive Power-Train Systems	3	0	9	6
AUT	1125—Automotive Servicing	3	0	9	6
BUS	1103—Small Business Operations	3	0	0	3
WLD	1101-C—Basic Welding	0	0	3	1
		9	0	21	16

See pages 154 to 173 for Course Descriptions.

BOAT BUILDING

The history of the State of North Carolina is steeped in a tradition of boat building from the time early settlers first set foot on our land. North Carolina, with its long coastline, its expansive sounds, its rivers and creeks, provides the optimum environment for a plethora of waterborne vehicles.

Today there are more boats owned by North Carolinians than at any other time in our history, and expectations are for an even greater increase for the future. The popularity of sportsfishing, sailing, and just plain motorboating has placed a burden upon boatbuilding firms to meet the ever-increasing demand for pleasure boats.

The recently enacted 200-mile commercial fishing limit means a rejuvenation of the American commercial fishing industry, long dormant because of the influx of foreign fishing fleets on our shores. The fact is that the U.S.A. does not have enough fishing vessels at the present time to effectively exploit these new "Americanized" fishing grounds.

Predictions are for a vastly increased boat building industry for North Carolina requiring not only new factories and boat repair facilities but hundreds and maybe thousands of people skilled in the art of building and repairing boats.

As a result of these developments, Cape Fear Technical Institute, the *recognized leader* in the field of marine education in the United States, will offer a one-year trade program in the art of boat building and repair. Upon completion of the program, a young man or woman should be able to find gainful employment in any one of the many boat building and boat repair firms located in North Carolina or surrounding states.

BOAT BUILDING

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
MAT	1101-C—Trade Mathematics	5	0	0	5
DFT	1104—Blueprint Reading	2	0	3	3
MRO	1140—Marine Safety—First Aid	2	0	0	2
MSC	1106—Introduction to Hand and Machine Woodworking Tools	2	0	3	3
MSC	1110—Boat Building I	1	0	12	5
		12	0	18	18
SECOND QUARTER					
MAT	1102-C—Trade Mathematics	5	0	0	5
DFT	1105—Blueprint Reading	0	0	3	1
WLD	1106—Welding and Burning I	0	0	6	2
MSC	1111—Boat Building II	1	0	15	6
		6	0	24	14
THIRD QUARTER					
ENG	1101-C—Communication Skills	2	0	0	2
WLD	1107—Welding and Burning II	0	0	6	2
MSC	1104—Boat Design and Ship's Plans	5	0	0	5
MSC	1112—Boat Building III	2	0	15	7
		9	0	21	16
FOURTH QUARTER					
ENG	1102-C—Communication Skills	2	0	0	2
WLD	1108—Basic Inert Gas Welding for Marine Application	0	0	6	2
MSC	1113—Boat Building IV	1	0	21	8
		3	0	27	12

See pages 154 to 173 for Course Descriptions.

COMMERCIAL FISHING

The Commercial Fishing Industry is comprised of approximately 160,000 men using various combinations from primitive hand-line to sophisticated equipment to harvest large quantities of fish.

Many opportunities exist for individuals who have the technology and skills required in working aboard commercial fishing boats. This curriculum puts great stress on the development of commercial fishermen through practical hands-on application in all phases of this highly skilled trade. Included in this program is emphasis on maintenance and repair of all equipment used aboard the fishing vessel. The various seamanship skills expected of a man pursuing this vocation are also thoroughly covered and put into actual practice at sea.

The objective of this curriculum is to develop within each individual the ability to function effectively at any task assigned to him as a member of a commercial fishing crew.

To accomplish the goals of this program, extensive field trips are necessary. The duration of these trips will be overnight to three days, and occasionally one week or more.

COMMERCIAL FISHING

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
MAT	1101-C—Trade Mathematics	5	0	0	5
MRO	1101—Rules of the Road and Piloting	3	2	0	4
WLD	1106—Welding and Burning I	0	0	6	2
MRO	1106—Practical Marine Engineering I	2	0	3	3
MRO	1139—Rigging and Seamanship	2	0	3	3
MRO	1140—Marine Safety—First Aid and Lifeboat Drills, and Firefighting Aboard Ship	1	0	3	2
		13	2	15	19
SECOND QUARTER					
MRO	1102—Electronic Aids to Navigation	1	2	0	2
ENG	1101-C—Communication Skills	2	0	0	2
MRO	1107—Practical Marine Engineering II	0	0	6	2
CFT	1101—Fishing Operations I	0	0	6	2
WLD	1107—Welding and Burning II	0	0	6	2
ELC	1106—Practical Marine Electricity I	0	6	0	3
		3	8	18	13
THIRD QUARTER					
PSY	1104—Job Adjustment Skills	2	0	0	2
BUS	1103—Small Business Operations	3	0	0	3
CFT	1102—Fishing Operations II	0	0	6	2
MRO	1108—Practical Marine Engineering III	0	0	6	2
DFT	1111—Machine Trades Blueprint Reading and Sketching	1	0	3	2
ELC	1107—Practical Marine Electricity II	0	6	0	3
		6	6	15	14
FOURTH QUARTER					
MSC	2001—Marine Fishery Science and Seafood Handling	2	2	0	3
MSC	1030—Navigation	1	0	3	2
CFT	1103—Fishing Operations III	0	0	12	4
MRO	1109—Practical Marine Engineering IV	0	0	6	2
BIO	1101—Marine Biology, Introduction	4	0	0	4
		7	2	21	15

See pages 154 to 173 for Course Descriptions.

DRAFTING—MECHANICAL

This curriculum is designed to prepare students to enter the field of mechanical drafting. The first two quarters contain courses basic to all fields of drafting. The third and fourth quarters contain specialized and related courses that prepare one to enter mechanical drafting occupations.

Each course is prepared to enable an individual to advance rapidly in drafting proficiency upon entering the field of work. Courses are arranged in sequence to develop drafting skills and proficiency in mathematics and science. The draftsman associates with many levels of personnel—administrative, architects, engineers, skilled workmen—and must be able to communicate effectively with them. Courses to develop knowledge and skills in communication, human relations, economics and industrial organization are provided to assist the student in developing understanding and confidence in his relations with other persons.

A draftsman prepares clear, complete, and accurate working plans and detail drawings, from rough or detailed sketches or notes for engineering or manufacturing purposes, according to the specified dimensions: makes final sketch of the proposed drawing, checking dimension of parts, materials to be used, the relation of one part to another, and the relation of the various parts to the whole structure. Makes any adjustments or changes necessary or desired. Inks in lines and letters on pencil drawings as required. Exercises manual skill in the manipulation of triangle, T-square, and other drafting tools. Lays tracing paper on drawing and traces drawing in pencil or ink. Makes charts for representation of statistical data. Makes finished designs from sketches. Utilizes knowledge of various machines, engineering practices, mathematics, building materials, and other physical sciences to complete the drawings.

A mechanical draftsman performs the general duties of a draftsman and also specializes in making rough drafting sketches of proposed mechanical devices, and then drawing necessary details. From specifications, he accurately draws the part or machine requested.

DRAFTING — MECHANICAL

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
DFT	1121—Drafting	3	0	15	8
MAT	1101-C—Trade Mathematics	5	0	0	5
ENG	1101-C—Communication Skills	2	0	0	2
PHY	1101—Applied Science	3	2	0	4
		13	2	15	19
SECOND QUARTER					
DFT	1122—Drafting	3	0	15	8
MAT	1102-C—Trade Mathematics	5	0	0	5
ENG	1102-C—Communication Skills	2	0	0	2
PHY	1102—Applied Science	3	2	0	4
		13	2	15	19
THIRD QUARTER					
DFT	1131—Mechanical Drafting	5	0	12	9
MAT	1104-C—Trigonometry	3	0	0	3
PSY	1101—Human Relations	3	0	0	3
MEC	1113—Shop Processes	1	0	3	2
MEC	1115-C—Applied Metallurgy	2	2	0	3
		14	2	15	20
FOURTH QUARTER					
DFT	1132—Mechanical Drafting	5	0	12	9
MEC	1114—Shop Processes	1	0	3	2
MEC	1116-C—Applied Metallurgy	2	2	0	3
BUS	1105—Industrial Organization	3	0	0	3
		11	2	15	17

See pages 154 to 173 for Course Descriptions.

ELECTRONICS SERVICING

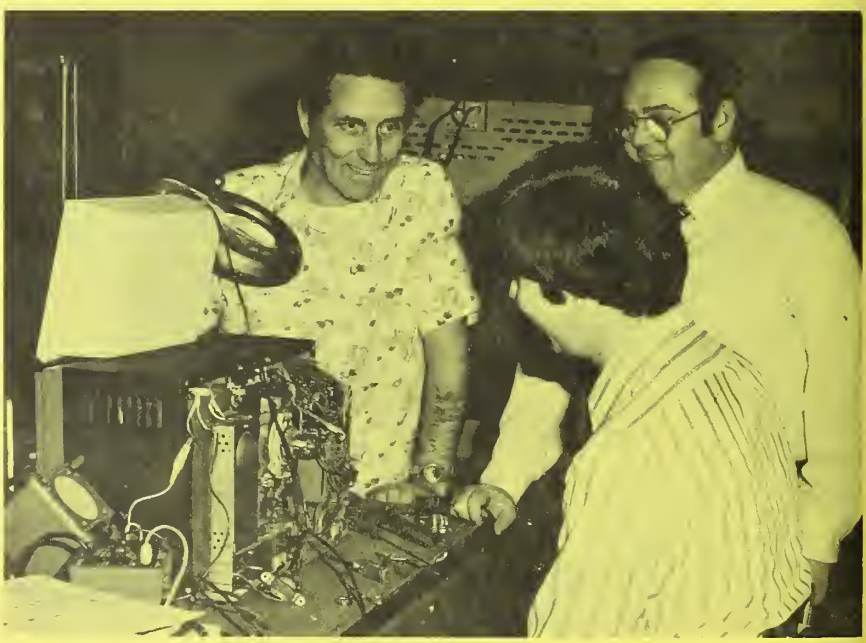
Within recent years improved electronic techniques have provided expanded entertainment and educational facilities in the form of monochrome and color television, frequency-modulated radio, high-fidelity amplifiers and stereophonic-sound equipment. These developments require expanded knowledge and skill of the individual who would qualify as a competent and up-to-date serviceman.

This curriculum provides a training program which includes the basic knowledge and skills involved in the installation, maintenance and servicing of radio, television and sound-amplifier systems. A large portion of time is spent in the laboratory verifying electronic principles and developing servicing techniques.

Electronics service technician may be required to install, maintain and service amplitude-modulated and frequency-modulated home and auto radios, transistorized radios, monochrome and color television sets, intercommunication, public address and paging systems, high-fidelity and stereophonic amplifiers, record players and tape recorders.

His work will require meeting the public both in the repair shop and on service calls. A service technician who establishes his own business will also need to know how to maintain business records and inventory.

All graduates are encouraged to take the Certified Electronics Technician Exam.



ELECTRONICS SERVICING

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
ELC	1110—Basic Electricity DC	5	0	6	7
ELC	1111—Basic Electricity AC	5	0	6	7
ENG	1101-C—Communication Skills	2	0	0	2
MAT	1109—Mathematics for Electronic Servicing	5	0	0	5
		17	0	12	21
SECOND QUARTER					
MAT	1110—Mathematics for Electronic Servicing	5	0	0	5
ENG	1102-C—Communication Skills	2	0	0	2
ELN	1122-C—Vacuum Tubes and Circuits	2	0	6	4
ELN	1126-C—Solid State Theory and Circuits	6	0	9	9
		15	0	15	20
THIRD QUARTER					
ELN	1125-C—Radio Receiver Servicing	3	0	6	5
PSY	1101—Human Relations	3	0	0	3
ELN	1127-C—Television Receiver Circuits and Servicing	7	0	6	9
PHY	1105—Applied Science	3	2	0	4
		16	2	12	22
FOURTH QUARTER					
ELN	1131-C—Television Receiver Service (Color)	9	0	18	15
BUS	1103—Small Business Operations	3	0	0	3
		12	0	18	18

See pages 154 to 173 for Course Descriptions.

HEATING AND AIR CONDITIONING

Through this curriculum Cape Fear Technical Institute provides a training program for the instruction of students in the basic knowledges and skills involved in servicing and installing heating and air conditioning equipment. Manual skills are emphasized in practical shop work combined with a thorough understanding of the operating principles involved in heating and air conditioning.

The heating and air conditioning industry is one of the fastest growing fields today. With the ever-increasing use of air conditioning in industries and the even faster growing use of air conditioning and heating systems in domestic use, the need for service people to install and maintain this equipment has surpassed the available supply of trained personnel. This need for trained people has become so great that a program for training is necessary. Because of the increasing engineering complexity caused by the demand for more efficient, more compact, and dual capacity units, this curriculum to train people and to upgrade present-day servicemen has been prepared.

In North Carolina a contractor in the heating and air conditioning field is required by law to hold a state license. The serviceman or mechanic is not required to hold a license. The material presented herein is basic to the passing of this state's license examination. With job experience, a graduate should be able to successfully pass the examination and acquire a contractor's license.

The heating and air conditioning mechanic installs, services and repairs equipment used in the heating and cooling of domestic buildings, industrial buildings and mobile-type units. In general, a person will perform similar duties in any one of these fields, but often becomes a specialist in one. The mechanic uses blueprints and schematics, thus requiring a knowledge of blueprint reading. He services, installs, and maintains cooling components, heating devices, air and liquid-flow devices used in comfort heating of air and liquids, and fuel storage units. The duties may involve mechanical repairs, electrical motor repairs, control wiring, electrical and gas tests, pipe and tubing fitting, duct and fitting fabrication, equipment installation, shop sketching of equipment and flow devices for installations, and equipment sizing.

HEATING AND AIR CONDITIONING

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
AHR	1116—Oil Burner Installation and Service	4	0	6	6
MAT	1101-C—Trade Mathematics	5	0	0	5
ELC	1102-C—Applied Electricity—Part I	3	0	0	3
DFT	1104-C—Blueprint Reading	2	0	0	2
AHR	1121-C—Principles of Refrigeration—Part I	2	0	3	3
		16	0	9	19
SECOND QUARTER					
AHR	1117—Gas Burners, Electric Heat and Liquid Heat Applications	2	0	3	3
AHR	1125—Principles of Refrigeration—Part II	3	0	6	5
ELC	1103-C—Applied Electricity—Part II	2	0	0	2
DFT	1116-C—Blueprint Reading: Air Conditioning	1	0	3	2
EGY	1011—Introduction to Solar Energy Systems	1	2	0	2
		9	2	12	14
THIRD QUARTER					
AHR	1124-C—Air Conditioning Service	2	0	9	5
PHY	1101-C—Applied Science	3	0	0	3
AHR	1123—Principles of Air Conditioning	3	0	3	4
MAT	1102-C—Trade Mathematics	5	0	0	5
		13	0	12	17
FOURTH QUARTER					
AHR	1126—All Year Comfort Systems	3	0	9	6
AHR	1109—Job Planning and Estimating	2	0	0	2
PSY	1101-C—Human Relations	2	0	0	2
AHR	1128—Automatic Controls	3	0	6	5
		10	0	15	15

See pages 154 to 173 for Course Descriptions.

INDUSTRIAL AIR CONDITIONING (Specialty)

The Industrial Air Conditioning curriculum is a special offering by the Institute designed to provide the student with basic knowledge and skills which will enable him to become employed in industry as an air conditioning maintenance and service man.

The application of various types of air conditioning and compressor units by industry has been on the increase as firms endeavor to upgrade quality control and the working environments of their employees.

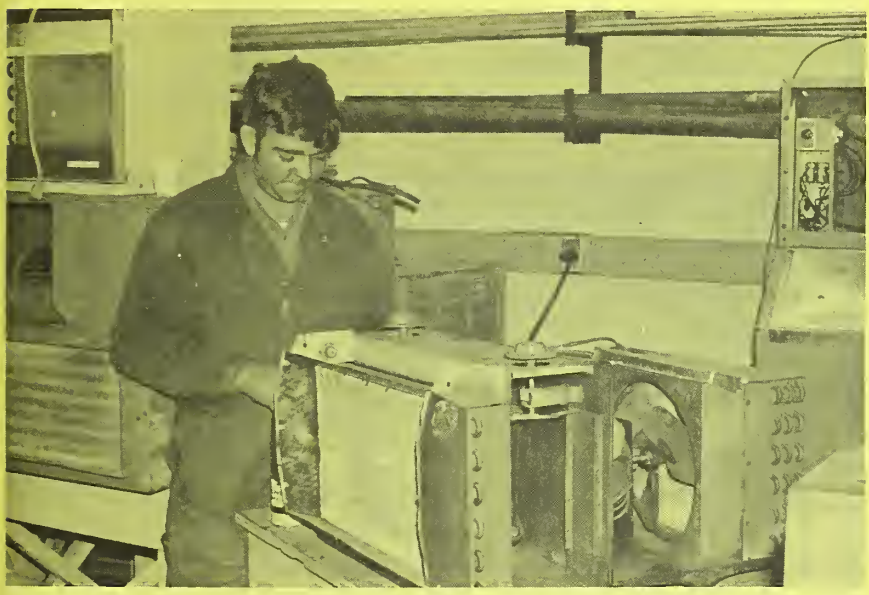
Individuals knowledgeable and with skills in industrial air conditioning are generally employed and assigned to the firm's maintenance department with responsibilities towards maintaining the plant's physical facilities and equipment.

This is a certificate course.

INDUSTRIAL AIR CONDITIONING (Specialty)

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
AHR	1101—Industrial Air Conditioning I	3	0	12	7
MAT	1101-C—Trade Mathematics	5	0	0	5
DFT	1104-C—Blueprint Reading	2	0	0	2
		10	0	12	14
SECOND QUARTER					
AHR	1102—Industrial Air Conditioning II	4	0	9	7
MAT	1102-C—Trade Mathematics	5	0	0	5
DFT	1116-C—Blueprint Reading: Air Conditioning	1	0	3	2
		10	0	12	14

See pages 154 to 173 for Course Descriptions.



INDUSTRIAL ELECTRICITY

Industrial electricians maintain and repair many different types of electrical equipment. In addition, they sometimes modify and install electrical equipment such as motors, transformers, generators, controls, instruments, and lighting systems used in industries.

A large part of an industrial electrician's work is preventive maintenance—periodic inspection of equipment to find and repair defects before breakdowns occur. When trouble does develop, he must find and repair the faulty circuit or equipment quickly in order to prevent costly production losses and inconvenience. It is the electrician's responsibility also to insure that electrical systems are so installed that hazards to equipment and personnel are held to a minimum.

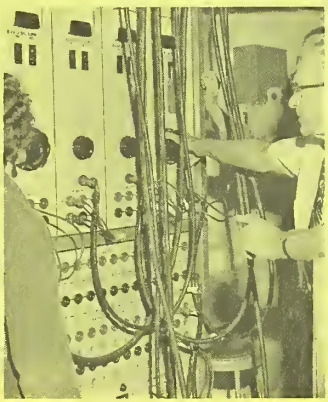
In his daily work, the industrial electrician does many different things. For example, he may make repairs by replacing units or parts such as wiring, fuses, circuit breakers, coils, or switches. While doing repair or installation work, the electrician may connect wires by splicing or by using mechanical connectors. He may measure, cut, bend, thread, and install conduits through which wires are run to outlets, panels, and boxes. He also may adjust equipment controls and check and adjust instruments.

Industrial electricians are employed in every State. Large numbers work in heavily industrialized States.

INDUSTRIAL ELECTRICITY

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
ELC	1104—Basic Electricity I	5	0	9	8
ELN	1106—Instrument Familiarization	3	0	6	5
ENG	1101-C—Communication Skills	2	0	0	2
MAT	1101-C—Trade Mathematics	5	0	0	5
		15	0	15	20
SECOND QUARTER					
ELC	1105—Basic Electricity II	5	0	9	8
ELN	1111—Electro-Mechanical Relays and Symbols	3	0	6	5
ENG	1102-C—Communication Skills	2	0	0	2
MAT	1125—Industrial Calculations	5	0	0	5
		15	0	15	20
THIRD QUARTER					
ELC	1115—AC and DC Machinery	4	0	9	7
ELC	1116—Motor Control	3	0	6	5
PSY	1101—Human Relations	3	0	0	3
DFT	1104—Blueprint Reading	2	0	3	3
		12	0	18	18
FOURTH QUARTER					
ELC	1125—Industrial Wiring Practices	5	0	6	7
ELN	1130—Solid State Devices, Circuits and Symbols	5	0	6	7
DFT	1108-C—Blueprint Reading	2	0	3	3
ELC	1130—Field Trips, Industrial Installations	0	0	3	1
		12	0	18	18

See pages 154 to 173 for Course Descriptions.



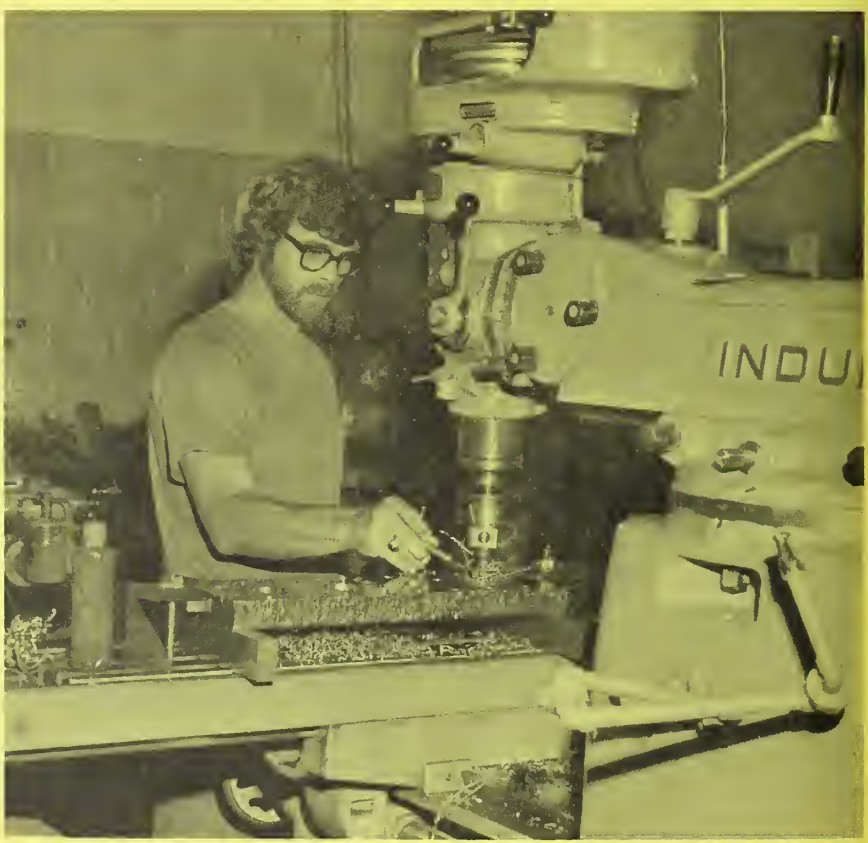
INDUSTRIAL MACHINE OPERATOR (Specialty)

The Industrial Machine Operator curriculum is a special curriculum designed to provide the student with the basic knowledge and skills that will enable him to enter industry as a machine operator.

Emphasis is placed on machine shop hand tools, measuring instruments, machine safety, operation and nomenclature. Included also are emphasis on mathematics as applied to a machine shop and blueprint reading as applied to a typical machine shop.

The curriculum is a two-quarter curriculum (6 months) designed to enable the new employee to communicate well and carry out all responsibilities assigned to him by his immediate supervisor while he works as a machine operator.

This is a certificate course.



INDUSTRIAL MACHINE OPERATOR (Specialty)

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
MEC	1131—Industrial Machine Operator I	3	0	9	6
MAT	1101-C—Trade Mathematics	5	0	0	5
DFT	1104—Blueprint Reading	2	0	3	3
		10	0	12	14
SECOND QUARTER					
MEC	1132—Industrial Machine Operator II	5	0	9	8
MAT	1102-C—Trade Mathematics	5	0	0	5
DFT	1105—Blueprint Reading	0	0	3	1
		10	0	12	14

See pages 154 to 173 for Course Descriptions.

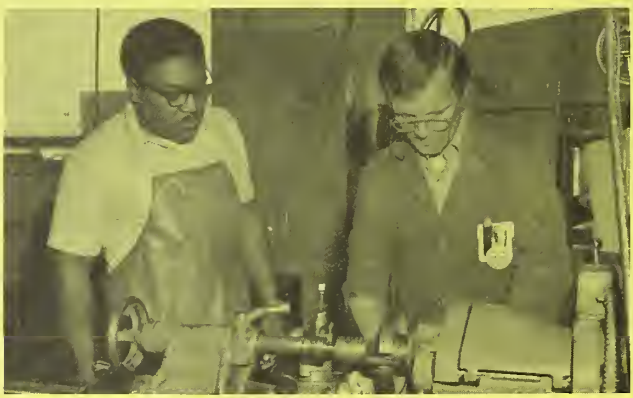
MACHINE TRADES

This curriculum was prepared to meet a definite need for training of machinists. Surveys recently completed in North Carolina show that many of the existing industries lack time and facilities for training enough machinists to meet present and planned needs. Expanding industries already located in our State and new industries under development invariably express the need for skilled craftsmen who have the background knowledge and potential to advance.

This guide is designed to give learners the opportunity to acquire basic skills and the related technical information necessary to gain employment and build a profitable career in the machine shop industry in the State. It is comprised of the joint views of committees responsible for its development.

The machinist is a skilled metal worker who shapes metal parts by using machine tools and hand tools. His training and experience enable him to plan and carry through all the operations needed in turning out a machined product and to switch readily from one kind of product to another. A machinist is able to select the proper tools and material required for each job and to plan the cutting and finishing operations in their proper order so that he can complete the finished work according to blueprint or written specifications. He makes standard shop computations relating to dimensions of work, tooling, feeds, and speeds of machining. He often uses precision measuring instruments such as micrometers and gauges to measure the accuracy of his work to thousandths of an inch.

This skilled worker must be able to set up and operate most types of machine tools. The machinist also must know the composition of metals so that he can heat and quench cutting tools and parts to improve machinability. His wide knowledge enables him to turn a block of metal into an intricate, precise part.



MACHINE TRADES

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
MEC	1101—Machine Shop Theory and Practice	3	0	15	8
ENG	1101-C—Communication Skills	2	0	0	2
MAT	1101-C—Trade Mathematics	5	0	0	5
DFT	1104—Blueprint Reading	2	0	3	3
		12	0	18	18
SECOND QUARTER					
MEC	1102—Machine Shop Theory and Practice	3	0	15	8
MAT	1102-C—Trade Mathematics	5	0	0	5
DFT	1105—Blueprint Reading	0	0	3	1
WLD	1101—Basic Welding	1	0	3	2
		9	0	21	16
THIRD QUARTER					
MEC	1103—Machine Shop Theory and Practice	3	0	15	8
MAT	1104-C—Trigonometry	3	0	0	3
DFT	1106—Blueprint Reading	0	0	3	1
MEC	1115-C—Applied Metallurgy	2	2	0	3
ENG	1102-C—Communication Skills	2	0	0	2
		10	2	18	17
FOURTH QUARTER					
MEC	1104—Machine Shop Theory and Practice	4	0	12	8
MEC	1116-C—Applied Metallurgy	2	2	0	3
MAT	1123—Machinists Mathematics	5	0	0	5
PHY	1101—Applied Science	3	2	0	4
		14	4	12	20

See pages 154 to 173 for Course Descriptions.

MARINE AND DIESEL MECHANICS

This curriculum provides a training program for developing the basic knowledge and skills needed to inspect, diagnose, repair or adjust gasoline and diesel powered equipment. Manual skills are developed in practical shop work. Thorough understanding of the operating principles involved in the modern internal combustion engine, drive lines, power trains, fuel, electrical and hydraulic systems are studied. Oxyacetylene, heating and burning, machine shop processes, schematics and diagrams and other related subjects, vital to a well trained engine mechanic are also included.

Complexity in gasoline and diesel powered vehicles or equipment increases each year because of scientific discovery and new engineering. The use of gasoline and diesel engines in power farm and construction equipment, electric generators, trucks, buses, trains, automobiles and marine applications has been increasing.

Gasoline and diesel vehicle mechanics maintain and repair engines, chassis, power trains used to power tractors, construction equipment, buses, trucks and marine applications. They use hand tools, precision measuring and testing instruments, and power tools necessary in overhauling and maintaining gasoline and diesel powered equipment.

This curriculum provides a basis for the student to compare and adapt to new techniques for servicing and repair as engines and vehicles are changed year by year.

MARINE AND DIESEL MECHANICS

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
PME	1101—Internal Combustion Engine	3	0	15	8
MAT	1101-C—Trade Mathematics	5	0	0	5
PHY	1101—Applied Science	3	2	0	4
ENG	1101-C—Communication Skills	2	0	0	2
		13	2	15	19
SECOND QUARTER					
MDE	1101—Marine and Diesel Engines Theory and Practice	3	0	15	8
ELC	1112—Direct Current Electricity	1	0	3	2
MEC	1113—Shop Processes	1	0	3	2
PME	1131—Schematics and Diagrams: Marine and Diesel	1	0	3	2
		6	0	24	14
THIRD QUARTER					
MDE	1102—Marine and Diesel Engines Theory and Practice	3	0	12	7
ELC	1113-C—Alternating and Direct Current Machines and Controls	1	0	3	2
WLD	1101—Basic Welding	1	0	3	2
MEC	1114—Shop Processes	1	0	3	2
PSY	1101—Human Relations	3	0	0	3
		9	0	21	16
FOURTH QUARTER					
MDE	1103—Marine and Diesel Engines Theory and Practice	3	0	15	8
PME	1136—Fundamentals of Hydraulics	3	0	6	5
BUS	1103—Small Business Operations	3	0	0	3
		9	0	21	16

See pages 154 to 173 for Course Descriptions.

MARINE MAINTENANCE AND RELATED OCCUPATIONS

All indications point to a critical shortage of skilled workers in ocean-related industries. Personnel that have some training in such skills as boat repair, boat painting, and maintenance, as well as boat operation and small boat engine mechanics are reported to be in short supply. Marine construction firms have informed us that not only are their operations being curtailed by a shortage of technicians, but that skilled workers are also hard to find.

Accordingly then, Cape Fear Technical Institute hopes to alleviate this situation by establishing a marine occupations program to train young people for ocean-related industries. The one-year course will place heavy emphasis on the practical application of a variety of skills that are useful in the marine industrial field.

It is anticipated that many of the graduates of the Marine Maintenance and Related Occupations Program will become employed on boats and ships as deck hands or apprentice engineers. Therefore, a part of the training of the student requires a certain amount of "sea time" to be served on board the Institute's training vessels, particularly the large research ship, **Advance II.**

It is aboard these ships that navigation and marine engineering is given practical application. By serving with the mates and other officers on deck, the student will gain "first hand" knowledge of the daily operation of a sea-going craft.

In the engine room, the student "standing watches" with the ship's engineers will gain useful experience in the operation of the ship's main engines, pumps, auxiliaries, and other machinery.

Approximately two weeks in each quarter will be spent aboard ship at sea. The actual amount of time will vary according to the length of a cruise, i.e., a cruise may be of 10-20 days' duration.

MARINE MAINTENANCE AND RELATED OCCUPATIONS

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
MRO	1139-C—Rigging and Seamanship	1	0	3	2
MRO	1101-C—Rules of the Road and Piloting I	1	4	0	3
WLD	1106—Welding and Burning I	0	0	6	2
MRO	1106—Practical Marine Engineering I	2	0	3	3
SHI	1101—Ships' Equipment, Maintenance, and Repair I	1	0	9	4
***	Ship Cruises				
		5	4	21	14
SECOND QUARTER					
MRO	1102—Electronic Aids to Navigation	1	2	0	2
WLD	1107—Welding and Burning II	0	0	6	2
MRO	1107—Practical Marine Engineering II	0	0	6	2
ELC	1106—Practical Marine Electricity I	0	6	0	3
SHI	1102—Ships' Equipment, Maintenance, and Repair II	0	0	9	3
***	Ship Cruises				
		1	8	21	12
THIRD QUARTER					
PSY	1104—Job Adjustment Skills	2	0	0	2
MRO	1108—Practical Marine Engineering III	0	0	6	2
ELC	1107—Practical Marine Electricity II	0	6	0	3
MRO	1140—Marine Safety—First Aid and Life Boat Drills and Fire Fighting Aboard Ship	1	0	3	2
SHI	1103—Ships' Equipment, Maintenance and Repair III	0	0	9	3
***	Ship Cruises				
		3	6	18	12
FOURTH QUARTER					
DFT	1104—Machine Shop Blueprint Reading	2	0	3	3
MRO	1109—Practical Marine Engineering IV	0	0	6	2
ELC	1108—Practical Marine Electricity III	0	6	0	3
MRO	1115—Towboat Operations	0	0	6	2
SHI	1104—Ships' Equipment, Maintenance, and Repair IV	0	0	9	3
***	Ship Cruises				
		2	6	24	13

***Ship Cruises: Approximately two weeks in each quarter will be spent aboard ship at sea. The actual amount of time will vary according to the length of a cruise, i.e., a cruise may be of 10-20 days' duration.

See pages 154 to 173 for Course Descriptions.

OPERATING ROOM ASSISTANT

With more hospitals being built, and the rapid advancement in Surgical Techniques there is an increasing demand for more well-trained personnel in the Operating Room area.

The aim of the Operating Room Assistant Course is to make available to qualified persons the opportunity to prepare themselves to function intelligently under the direct and continuous supervision of qualified professional nurses in hospital areas which are concerned with principles and practices of Surgical Aseptics in Operating Rooms, Delivery Rooms, and Central Service Department.

Students are selected on the basis of demonstrated aptitude for O.R. Assistants as determined by pre-entrance tests, interviews with faculty members, including Surgeons, high school record, character references, and medical reports.

During the nine-month course the student is expected to grow continuously in acquisition of knowledge and understanding, related to Operating Room Technique, Basic Anatomy, Physiology, Basic Microbiology, Aseptics, Communication Skills, Inter-personal relationship, and the use of good judgment. Evaluation of student performance consists of tests on all phases of course content, evaluation of clinical performance, and evaluation of adjustment to the responsibilities that is expected of an Operating Room Assistant. A passing score is required on all graded work, plus demonstrated progress in the clinical area of the Operating Room.

Students completing this Operating Room Assistant Course will be qualified to work in the Operating Room and assist the doctor or surgeon while under the supervision of the professional nurse.

A State examination is required for all students completing this curriculum to obtain a license to work in a hospital operating room in North Carolina.

OPERATING ROOM TECHNICIAN

		HOURS PER WEEK			
		Class	Lab	Clinical	Credit
FIRST QUARTER					
BIO	1121—Human Anatomy and Physiology I	4	2	0	5
ENG	1101-C—Communications Skills	2	0	0	2
BIO	1123—Introduction to Microbiology	4	2	0	5
NUR	1100—Nursing Procedures	4	2	0	5
SUR	1101—Introduction to Operating Room	4	2	0	5
		18	8	0	22
SECOND QUARTER					
BIO	1122—Human Anatomy and Physiology II	4	2	0	5
SUR	1102—Surgical Procedures I	5	2	0	6
SUR	1106—Suggested Seminar I	2	0	0	2
SUR	1104—Clinical Practice I	0	0	15	5
		11	4	15	18
THIRD QUARTER					
SUR	1103—Surgical Procedures II	4	2	0	5
SUR	1105—Clinical Practice II	0	0	24	8
SUR	1107—Lecture Seminar	1	0	0	1
		5	2	24	14

See pages 154 to 173 for Course Descriptions.

PRACTICAL NURSE EDUCATION

The accelerated growth of population in North Carolina and rapid advancement in medical technology demand an increased number of well-trained personnel for health services. Realizing this need, the State Department of Community Colleges, in conjunction with local hospitals, administers programs of practical nurse education in local systems, community colleges, technical institutes and in industrial education centers throughout the State.

The aim of the Practical Nurse Education Program is to make available to qualified persons the opportunity to prepare for participation in care of patients of all ages, in various states of dependency, and with a variety of illness conditions.

Students are selected on the basis of demonstrated aptitude for nursing as determined by pre-entrance tests, interviews with faculty members, high school record (students in this program must be a high school graduate or the equivalent*), character references, and reports of medical and dental examination.

Throughout the one-year program the student is expected to grow continuously in acquisition of knowledge and understanding related to nursing, the biological sciences, the social sciences and in skills related to nursing practice, communications, interpersonal relations, and use of good judgment. Evaluation of student performance consists of tests on all phases of course content, evaluation of clinical performance, and evaluation of adjustment to the responsibilities of nursing. A passing score is required on all graded work, plus demonstrated progress in application of nursing skills to actual patient care.

Graduates of accredited programs of practical nurse education are eligible to take the licensing examination given by the North Carolina Board of Nursing. This examination is given twice each year, usually in April and October. A passing score entitles the individual to receive a license and to use a legal title "Licensed Practical Nurse." The license must be renewed annually. The Licensed Practical Nurse can apply for licensure in other states on the basis of a satisfactory examination score, without repeating the examination.

The LPN is prepared to function in a variety of situations: hospitals of all types, nursing homes, clinics, doctors' and dentists' offices and in some localities, public health facilities. In all situations the LPN functions under supervision of a registered nurse and/or licensed

*See page 178 in General Adult Education Section for details about the high school equivalency certificate.

physician. This supervision may be minimal in situations where the patient's condition is stable and not complex; or it may consist of continuous direction is situations requiring the knowledge and skills of the registered nurse or physician. In the latter situation, the LPN may function in an assisting role in order to avoid assuming responsibility beyond that for which the one-year program can prepare the individual.

Job requirements for the Licensed Practical Nurse include suitable personal characteristics, ability to adapt knowledge and understanding of nursing principles to a variety of situations, technical skills for performance of bedside nursing, appreciation for differences of people and for the worth of every individual, a desire to serve and help others, and readiness to conform to the requirements of nursing ethics and hospital policies.

PRACTICAL NURSE EDUCATION

CURRICULUM BY QUARTERS

	HOURS PER WEEK			
FIRST QUARTER	**Class**	**Lab**	**Clinical**	**Credit**
NUR 1101—Practical Nursing I	25	2	3	27
SECOND QUARTER				
NUR 1102—Practical Nursing II	12	2	21	20
THIRD QUARTER				
NUR 1103—Practical Nursing III	10	2	24	19
FOURTH QUARTER				
NUR 1104—Practical Nursing IV	10	2	24	19

See pages 154 to 173 for Course Descriptions.

WELDING

This curriculum was developed to fill the tremendous need for welders in North Carolina. The recently completed Manpower Survey shows quite clearly that many welders will be needed annually to fill present and projected vacancies in the State.

The content of this curriculum is designed to give students sound understanding of the principles, methods, techniques and skills essential for successful employment in the welding field and metals industry.

The field of welding offers a person prestige, security and a future of continuous employment with a steady advancement. It offers employment in practically any industry: shipbuilding, automotive, aircraft, guided missiles, railroads, construction, pipe-fitting, production shop, job shop and many others.

Welders join metals by applying intense heat, and sometimes pressure, to melt the edges to form a permanent bond. Closely related to welding is "oxygen cutting." Of more than 35 different ways of welding metals, arc, gas, and inert gas welding are the three most important.

The principal duty of the welder using manual techniques is to control the melting by directing the heat from either an electric arc or gas welding torch, and to add filler metal where necessary to complete the joint. He should possess a great deal of manipulative skill with a knowledge of jigs, welding symbols, mathematics, basic metallurgy, and blueprint reading.

WELDING

		HOURS PER WEEK			
		Class	Lab	Manipulative Lab	Quarter Hours Credit
FIRST QUARTER					
WLD	1121—Arc Welding	4	0	12	8
MEC	1113—Shop Processes	1	0	3	2
MAT	1101-C—Trade Mathematics	5	0	0	5
		10	0	15	15
SECOND QUARTER					
WLD	1120—Oxyacetylene Welding and Cutting	4	0	12	8
MEC	1115-C—Applied Metallurgy	2	2	0	3
DFT	1112—Blueprint Reading for Welding	1	0	3	2
PHY	1101-C—Applied Science	3	0	0	3
		10	2	15	16
THIRD QUARTER					
WLD	1122—Commercial and Industrial Practices	0	0	3	1
WLD	1123—Inert Gas Welding: Tig, Mig, Plasma	4	0	9	7
DFT	1117-C—Blueprint Reading for Welding	0	0	3	1
ENG	1101-C—Communication Skills	2	0	0	2
PHY	1102-C—Applied Science	3	2	0	4
		9	2	15	15
FOURTH QUARTER					
WLD	1124—Pipe Welding	4	0	6	6
WLD	1125—Certification Practices	0	0	6	2
ENG	1102-C—Communication Skills	2	0	0	2
DFT	1119—Pattern Development and Sketching	0	0	6	2
PSY	1101-C—Human Relations	2	0	0	2
		8	0	18	14

See pages 154 to 173 for Course Descriptions.

TRADE COURSE DESCRIPTIONS

Ahr 1100—Automotive Air Conditioning: General introduction to the Principles of Refrigeration; study of assembly of the components and connections necessary in the mechanisms; the methods of refrigerants in charging the system.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Ahr 1101—Industrial Air Conditioning I: An introduction to industrial air conditioning deals with the control of temperature, humidity and air distribution equipment and maintenance of this equipment.

Course Hours Per Week: Class 3, M. Lab 12. Quarter Hours Credit 7.
Prerequisite: None

Ahr 1102—Industrial Air Conditioning II: A continuation of Ahr 1101. An introduction to psychrometric properties, the science of air conditioning, heat gain calculation and equipment sizing.

Course Hours Per Week: Class 4, M. Lab 9. Quarter Hours Credit 7.
Prerequisite: Ahr 1101

Ahr 1109—Job Planning and Estimating: Estimating loads and capacity of refrigeration and cooling units through the use of manuals, tables, and charts. Students will be expected to acquire sufficient knowledge to determine and recommend the adequate sizing of cooling units for specific uses either in homes or industry.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisites: Mat 1101-C, Mat 1102-C

Ahr 1116—Oil Burner Installation and Service: An introduction to the principle of heating, terminology, and the use and repair of equipment. Also included will be maintenance and service of heating units and diagnosing troubles within installation. Thermostat controls are also a part of this course.

Course Hours Per Week: Class 4, M. Lab 6. Quarter Hours Credit 6.
Prerequisite: None

Ahr 1117—Gas Burners, Electric Heat and Liquid Heat Applications: An introduction to the principles of heating with the use of gas, electric, or liquid heat units. The course includes installation and service to the above forms of heating units. The course will also include servicing and corrective maintenance techniques as it applies to the above three forms of heating units.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisites: Elc 1102-C, Elc 1103-C

Ahr 1121-C—Principles of Refrigeration (Part I): An introduction to the principles of refrigeration, terminology, the use and care of tools and equipment, and the identification and the function of the component parts of a system. Other topics to be included will be the basic laws of refrigeration; characteristics, and comparison of the various refrigerants; the use and construction of valves, fittings, and basic controls. Practical work includes tube bending, flaring and soldering. Standard procedures and safety measures are stressed in the use of special refrigeration service equipment and the handling of refrigerants.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3
Prerequisite: None

Ahr 1123—Principles of Air Conditioning: Emphasis is placed on the installation, maintenance, and servicing of equipment used in the cleaning, changing, humidification and temperature control of air in an air conditioned space. Installation of various ducts and lines needed to connect various components is made.

Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisites: Ahr 1121-C, Ahr 1125

Ahr 1124-C—Air Conditioning Servicing: Emphasis is placed on the installation, maintenance, and servicing of equipment used in the cleaning, changing, humidification and temperature control of air in an air conditioned space. Installation of various ducts and lines needed to connect various components is made. Shop work involves controls, testing and adjusting of air conditioning equipment, and location and correction of equipment failure.

Course Hours Per Week: Class 2, M. Lab 9. Quarter Hours Credit 5.
Prerequisites: Ahr 1121-C, Ahr 1125, Elc 1102-C, Elc 1103-C

Ahr 1125—Principles of Refrigeration (Part II): A continuation and more advanced study in refrigeration principles.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: Ahr 1121-C

Ahr 1126—All Year Comfort Systems: Auxiliary equipment used in conjunction with refrigeration systems to provide both heating and cooling for "all year" comfort will be studied and set up in the laboratory. Included will be oil fired systems, gas fired systems, water circulating systems, and electric-resistance systems. Installation of heat pumps will be studied along with servicing techniques. Reversing valves, special types of thermostatic expansion valves, systems of de-icing coils, and electric wiring and controls are included in the study.

Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisites: Ahr 1121-C, Ahr 1125, Ahr 1117

Ahr 1128—Automatic Controls: The study of various control thermostat systems used by manufacturers for the installation of their equipment. This course includes resetting and calibrating of control units used on the various heating systems. The principles of how these controls work is also discussed.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisites: Elc 1102-C, Elc 1103-C

Aut 1115—Trim, Glass and Radiator Repair: Principles of removal and installation of all phases of interior trim are applied. Cutting, sewing and installing headlinings, seat covers and door trim panels are covered in class and in their practical application. Glass removal, cutting, fitting and installation are covered in detail. A thorough knowledge of the engine cooling system, a study of repairs made necessary by accident to the system and testing to insure normal engine cooling operation are emphasized. Advanced painting of trim parts and accessories requiring extreme care and skill is included in the course.
Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: None

Aut 1120—Automotive Analysis: An analytical approach to trouble shooting and preventive maintenance through the use of mechanical equipment, electronic instrumentation, and visual inspection. Students will train on various electronic analysis equipment, chassis dynamometer, combustion analyzer, etc., for proper trouble-shooting diagnosis. Students will be instructed in procedures to be followed in trouble-shooting analysis of an internal combustion engine, brakes, steering and suspension, electrical circuits and drive lines.
Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

Aut 1121—Braking Systems: A complete study of various braking systems employed on automobiles and lightweight trucks. Emphasis is placed on how they operate, proper adjustment and repair and safety factors involved.
Course Hours Per Week: Class 3, M. Lab 3. Quarter Hours Credit 4.
Prerequisite: None

Aut 1123—Automotive Chassis and Suspension Systems: Principles and functions of the components of automotive chassis. Practical job instruction in adjusting and repairing of suspension and steering systems. Units to be studied: shock absorbers, springs, steering systems, steering linkage, and front end alignment.
Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisite: None

Aut 1124—Automotive Power-Train Systems: Principles and functions of automotive power train systems: clutches, transmission gears, torque converters, drive shaft assemblies, rear axles and differentials. Identification of troubles, servicing, and repair.
Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisite: None

Aut 1125—Automotive Servicing: Emphasis is on the shop procedures necessary in determining the nature of troubles developing in the various component systems of the automobile. Trouble-shooting of automotive systems, providing a full range of experiences in testing, adjusting, repairing and replacing.
Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisite: None

Aut 1126—Schematics & Diagrams: Automotive: Interpretation and reading of manufacturing diagrams. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.
Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

Bio 1101—Marine Biology, Introduction: A course designed to acquaint the student with the fundamentals of marine biology applicable to his field of work. Topics to be covered are basic marine biology, the biology of fouling organisms and their importance in marine industry, and basic water pollution to include state and federal pollution regulations.
Course Hours Per Week: Class 4. Quarter Hours Credit 4.
Prerequisite: None

Bio 1121—Human Anatomy and Physiology I: These persons that will spend their lives working in the medical fields, e.g., dental hygiene, nursing, etc., will find it necessary to have a fundamental knowledge of the structure of the human body. These persons will be expected to carry out specific directives, e.g., give injections, make x-rays of and manipulate various anatomical structures. These medical workers at various times may be expected to make judgments as to emergency action and may also be asked to carry out services for individuals which require knowledge beyond the scope of this course. These workers must have not only a working knowledge of specific human anatomy and physiology but some concept of the totality of the human in order to make rational decisions in the face of uncertainty when immediate action must be taken.
Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

Bio 1122—Human Anatomy and Physiology II: The purpose of this course is to provide an adequate understanding of anatomy and physiology to students enrolled in the allied health programs. In addition, the course will provide a comprehensive introduction to students wishing to pursue further studies in anatomy and physiology.
Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

Bio 1123—Introduction to Microbiology: A study of the fundamental principles of microorganisms, including identification, classification, morphology, culture methods and media, modes of transmission, sterilization, and pathogenic organisms.
Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

Bus 1103—Small Business Operations: An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business and employer-employee relations.
Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Bus 1105—Industrial Organization: Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.
Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Cft 1101—Fishing Operations I: Designed to introduce the student to the fundamental concepts of fish capturing devices on a commercial scale. A study of the various materials that nets and seines are made of and the reaction of marine animals upon encountering fish nets and traps. Basic net fabrication and net mending is included.
Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

Cft 1102—Fishing Operations II: A continuation of Cft 1101 with special emphasis on fish traps, crab and lobster traps, and weirs. Setting and hauling seines is practiced and the use of the seine boat is demonstrated.
Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: Cft 1101

Cft 1103—Fishing Operations III: The Otter trawl and other bottom trawls are discussed in this section with special emphasis on net blueprints. The shrimp trawl is studied in great detail with the setting and retrieving of the net from a commercial-sized trawler demonstrated.
Course Hours Per Week: M. Lab 12. Quarter Hours Credit 4.
Prerequisite: Cft 1102

Dft 1104—Blueprint Reading: Interpretation and reading of blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

Dft 1104-C—Blueprint Reading: Interpretation and reading of blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

Dft 1105—Blueprint Reading: Further practice in interpretation of blueprints as they are used in industry; study of prints supplied by industry; making plans of operations; introduction to drafting room procedures; sketching as a means of passing on ideas, information and processes. Schematic and wiring diagrams will be introduced.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: Dft 1104

Dft 1106—Blueprint Reading: Advanced blueprint reading and sketching as related to detail and assembly drawings used in machine shops. The interpretation of drawing of complex parts and mechanisms for features of fabrication, construction and assembly.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: Dft 1105

Dft 1108-C—Blueprint Reading: A general course in interpreting blueprints. Analysis of electrical and pneumatic systems will be emphasized. Mechanical devices including piping, machines, gears and system color coding will be introduced.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: Dft 1104

Dft 1111—Machine Trades Blueprint Reading & Sketching: Interpretation and reading of blueprints, information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Dft 1112—Blueprint Reading for Welding: A thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Dft 1116-C—Blueprint Reading: Air Conditioning: A specialized course in drafting for the heating, air conditioning and refrigeration student. Emphasis will be placed on reading of blueprints that are common to the trade; blueprints of mechanical components, assembly drawings, wiring diagrams and schematics, floor plans, heating system plans including duct and equipment layout plans, and shop sketches. The student will make tracings of floor plans and layout air conditioning systems.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: Dft 1104

Dft 1117-C—Blueprint Reading: Welding: This is a continuation of DFT 1112 which embodies a thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

Dft 1119—Pattern Development & Sketching: This course is designed for the student who has the basic knowledge of blueprint reading and sketching. It presents the practical shop or field layout methods used by pipe welders. Layouts are made on templet paper beginning with the simple plan and progressing to the most complex lateral connections that are used in industrial pipings. The student learns the steps in making rectangular and cylindrical layouts and patterns of offsets and intersections used on commercial jobs.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

Dft 1121—Drafting: An introduction to drafting and the study of drafting practices. Instruction is given in the selection, use and care of instruments, single-stroke lettering, applied geometry, freehand sketching consisting of orthographic and pictorial drawings. Orthographic projection, reading and instrument drawing of principal views, single auxiliary views (primary), and double (oblique) auxiliary views will be emphasized. Dimensioning and note practices will be studied with reference to the American Standards Association practices. Methods of reproducing drawings will be included at the appropriate time.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: None

Dft 1122—Drafting: The trainee will study simple and successive revolutions and their applications to practical problems. Sections and conventions will be studied and both detail and assembly sections will be drawn. Intersections and developments will be

studied by relating the drawing to the sheet metal trades. Models of the assigned drawings will be made from construction paper, cardboard, or similar materials as a proof of the solution to the problems drawn. Methods of drawing and projected axonometric, oblique, and perspective drawings will be studied with emphasis on the practical applications of pictorial drawings. Various methods of shading will be introduced and dimensioning and sectioning of oblique and axonometric pictorials will be done.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: Dft 1121

Dft 1131—Mechanical Drafting: A continuation of mechanical drafting beginning with problems concerning precision and limit dimensioning. Methods of fastening materials, and fasteners: keys, rivets, springs, and welding. Symbols will be studied and drawings will be made involving these items. Principles of design will be introduced with the study of basic mechanisms of motion transfer; gears, cams, power trains, pulleys, belting and methods of specifying and calculating dimensions will be studied. Drawings will be made involving these mechanisms.

Course Hours Per Week: Class 5, M. Lab 12. Quarter Hours Credit 9.
Prerequisite: Dft 1122

Dft 1132—Mechanical Drafting: Principles of design sketching, design drawings, layout drafting, detailing from layout drawings, production drawings and simplified drafting practices constitute areas of study. Forging and casting drawings will be made from layouts. Specifications, parts list and bill of materials are emphasized in this course. The student will develop a complete set of working drawings of a tool, jig, fixture or simple machine and learn principles of design, handbook and manual usage.

Course Hours Per Week: Class 5, M. Lab 12. Quarter Hours Credit 9.
Prerequisite: Dft 1131

Egy 1101—Introduction to Solar Energy Systems: The basic theory and current state of the art of solar energy usage in residential, commercial and industrial heating, cooling and hot water. Basic concepts of solar radiation, thermodynamics and heat transfer will be introduced. Laboratory will include hands on testing and performance measurement of solar equipment and systems.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: None

Elc 1102-C—Applied Electricity—Part I: Introduction to basic theories and principles of electricity. Basic electric control circuits, Ohm's Law, series and parallel circuits.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Elc 1103-C—Applied Electricity (Part II): The use and care of test instruments and equipment used in servicing electrical apparatus for air conditioning and refrigeration installations. Electrical principles and procedures for trouble-shooting of the various electrical devices used in air conditioning, heating and refrigeration equipment. Included will be transformers, various types of motors and starting devices, switches, electrical heating devices and wiring.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: Elc 1102-C

Elc 1104—Basic Electricity I: Introduction to basic theories and principles of electricity. Basic electric units, symbols and Ohm's Law regarding series and parallel circuits.

Course Hours Per Week: Class 5, M. Lab 9. Quarter Hours Credit 8.
Prerequisite: None

Elc 1105—Basic Electricity II: Introduction to alternating current theory, sine wave generation and analysis, induction, reactance, impedance, phase relations, transformers, and power factor corrections.

Course Hours Per Week: Class 5, M. Lab 9. Quarter Hours Credit 8.
Prerequisite: Elc 1104

Elc 1106—Practical Marine Electricity I: An introduction to ship's power systems. The shore-tie is discussed and the ship's switchboards are studied. The differences in ship's wire and wiring systems from that of shoreside systems is covered in this course. Safety rules to avoid burns or electrocution are strictly enforced. Practical applications are emphasized throughout the course.

Course Hours Per Week: Lab 6. Quarter Hours Credit 3.
Prerequisite: None

Elc 1107—Practical Marine Electricity II: Operation, maintenance, and repair of ship's generators including transfer of power and phasing is studied in this course. The student will study ship's wiring from distribution boards to equipment and lights, etc.

Course Hours Per Week: Lab 6. Quarter Hours Credit 3.
Prerequisite: Elc 1106

Elc 1110—Basic Electricity DC: Introduction to Direct Current Flow. A study of the structure of matter and the electron theory. The relationships between voltage, current, and resistance in series, parallel, and series-parallel circuits. Mathematical analysis of direct current resistive circuits using Ohm's Law, Thevenin's Theorem, Norton's circuits.

Course Hours Per Week: Class 5, M. Lab 6. Quarter Hours Credit 7.
Prerequisite: None

Elc 1111—Basic Electricity AC: Introduction to alternating current flow. Fundamental principles of capacitors, inductors and time constants. A study of reactance, impedance, phase angle and resonance. Particular attention is given to the use of electrical measuring devices.

Course Hours Per Week: Class 5, M. Lab 6. Quarter Hours Credit 7.
Prerequisite: None

Elc 1112—Direct Current Electricity: Introduction to basic theories and principles of electricity. A study of the electrical systems of gasoline and diesel engines. Batteries, starters, generators/alternators, regulators, ignitions and wirings are covered. Students will work with special tools and testing equipment for the electrical systems.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Elc 1113-C—Alternating and Direct Current Machines and Controls: Provides fundamental concepts in single and polyphase alternating current circuits, voltages, currents, power measurements, transformers, and motors. Instruction in the use of electrical test instruments in circuits analysis, basic concepts of AC and DC machines and simple system controls. An introduction to the type control used in small appliances such as: thermostats, timers, or sequencing switches.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Elc 1115—AC and DC Machinery: AC and DC motors, generators, voltage and current regulations, speed control, reversing and braking systems, and characteristics are studied. The student will physically set up and wire various systems and then collect data to determine characteristics and efficiency of system.

Course Hours Per Week: Class 4, M. Lab 9. Quarter Hours Credit 7.
Prerequisite: Elc 1104

Elc 1116—Motor Control: Introduction to control components, i.e., contactors, motor starters, pilot devices, code considerations, types of control, control circuits, analysis of control circuits, maintenance and trouble-shooting of motor and control circuits including solid state.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisites: Eln 1111, Elc 1115

Elc 1125—Industrial Wiring Practices: Wiring methods in industrial complexes are covered, including wire sizing, splicing, and code. Raceways, wireways and duct systems are introduced. Accepted methods of wiring motors, motor starters, relays, and transformers are emphasized.

Course Hours Per Week: Class 5, M. Lab 6. Quarter Hours Credit 7.
Prerequisite: Eln 1116

Elc 1130—Field Trips, Industrial Installations: Industrial complexes will be toured under guided supervision. Visual inspections of electrical systems and informal discussions will take place concerning these systems.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: Elc 1125

Eln 1106—Instrument Familiarization: Functional use of various tools and test equipment used in the electrical field.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: None

Eln 1111—Electro-Mechanical Relays and Symbols: Introduction to various types of relays (AC and DC), operating principles and characteristics. Various relay symbols are introduced. Maintenance and construction of relays are studied.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: Eln 1106

Eln 1122-C—Vacuum Tubes and Circuits: An introduction to vacuum tubes and their development; the theory, characteristics and operation of vacuum diodes, semiconductor diodes, rectifier circuits, filter circuits, triodes and simple voltage amplifier circuits.

Course Hours Per Week: Class 2, M. Lab 6. Quarter Hours Credit 4.
Prerequisite: Elc 1104-C

Eln 1125-C—Radio Receiver Servicing: Principles of radio reception and practices of servicing; included are block diagrams of radio receivers, servicing techniques of AM and FM receivers by resistance measurements, signal injection, voltage analysis, oscilloscope methods of locating faulty stages and components and the alignment of AM and FM receivers.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: Eln 1122-C

Eln 1126-C—Solid State Theory and Circuits: Solid State Devices, theory, operation, characteristics and their application to audio and radio frequency amplifier and oscillator circuits.

Course Hours Per Week: Class 6, M. Lab 9. Quarter Hours Credit 9.
Prerequisite: Elc 1112-C

Eln 1127-C—Television Receiver Circuits and Servicing: A study of principles of television receivers, alignment of radio and intermediate frequency amplifiers, adjustment of horizontal and vertical sweep circuits will be taught. Techniques of trouble-shooting and repair of TV receivers with the proper use of associated test equipment will be stressed. Additional study of more specialized servicing techniques

and oscilloscope waveform analysis will be used in the adjustment, trouble-shooting and repair of the color television circuits.

Course Hours Per Week: Class 7, M. Lab 6. Quarter Hours Credit 9.
Prerequisite: Eln 1122-C

Eln 1130—Solid State Devices, Circuits and Symbols: Introduction to the theory and applications of solid state devices used in industry especially solid state control circuits for motors and related equipment. Basic transistor circuits, vacuum tubes, and basic vacuum tube circuits are covered.

Course Hours Per Week: Class 5, M. Lab 6. Quarter Hours Credit 7.
Prerequisites: Elc 1105, Dft 1109, Eln 1111

Eln 1131-C—Television Receiver Servicing (includes color): A broad servicing course including trouble-shooting, radios, television, record players, sound systems, and other electronic communication devices. Major emphasis will be placed upon studying colored television principles and theories. The service and repair of colored television sets will be included for laboratory work.

Course Hours Per Week: Class 9, M. Lab 18. Quarter Hours Credit 15.
Prerequisite: Eln 1127-C

Eng 1101-C—Communication Skills: This course concentrates on the language and task skills applied in job acquisition. Lessons involve use of the library, practice in filling out forms, doing company and self-research, writing resumes, and practicing interviews.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

Eng 1102-C—Communication Skills: This course emphasizes on-the-job communication methods and content. Lessons involve work with letters, memos, forms, and written/oral reports.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: Eng 1101-C

Mat 1101-C—Trade Mathematics: The course begins with decimal-number system and reviews the four fundamental operations of arithmetic. Common and decimal fractions are covered with practical applications of each. Powers and roots are covered with emphasis on square and square roots. The final unit in the course is on percentage.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

Mat 1102-C—Trade Mathematics: This is a continuation of Mat 1101-C. The course begins with formulas and simple equations and is followed by ratio and proportion. Linear measure of geometric figures is then introduced and surface measurement of regular geometric figures follows, with practical applications in both areas. Computation of volumes of regular solids is then presented followed by direct measurements, utilizing measuring instruments.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 1101-C

Mat 1103-C—Trade Mathematics: This course is designed for trade students that need work in basic algebra. The course begins with symbols in mathematics and leads into signed (or directed) numbers. Fundamentals of operations in algebra are then covered as a basis for simple equations. Factoring algebraic expressions and operations involving algebraic terms are the final units in this course.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisites: Mat 1101-C or Mat 1102-C

Mat 1104-C—Trigonometry: This course provides a basic foundation in

trigonometry, as relates to right triangles. Trigonometric ratios involving the sine, cosine and tangent are emphasized as applied to practical problems. Use of trigonometric tables, including interpolation is utilized. The laws of the sine and cosine are demonstrated for emphasis.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: Mat 1102-C, or equivalent

Mat 1109—Mathematics for Electronics Servicing: This is a basic course for electronics servicing. The course begins with a basic review in arithmetic. It includes: Ohm's Law, series and parallel circuits, voltage dividers, compound and bridge circuits, and shunts and multipliers.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

Mat 1110—Mathematics for Electronics Servicing: This is a continuation of Mat 1109. This course includes: Batteries, elementary network simplification, simultaneous equations, advanced network simplification, trigonometry, periodic functions and elementary plane vectors.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: Mat 1109 or equivalent

Mat 1123—Machinist Mathematics: Introduces gear ratio, lead screw and indexing problems with emphasis on application to the machine shop. Practical applications and problems furnish the trainee with experience in geometric proportions and trigonometric relations to shop problems; concludes with an introduction to compound angle problems.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: T-Mat 1104-C

Mat 1125—Industrial Calculations: Various problems involving calculations of wire sizes, electrical loads (power), feeders, voltages and currents in various transformer configurations, power costs, installation costs, and projected maintenance costs.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: Mat 1101-C

Mde 1101—Marine & Diesel Engines Theory & Practice: Principles of main propulsion of vessels employing internal combustion engines. Construction and various designs of the operational principles of two and four-cycle internal combustion engines and their related piping systems, cooling, fueling and lubrication. Study of the power train components, clutch, reduction gears, reverse gears, coupling, line shafting, and propellers. Procedures for "lighting off" operation, testing and recording engine performance, and servicing in a planned preventive maintenance program through periodic and recorded inspections.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: None

Mde 1102—Marine & Diesel Engines Theory & Practice: Diesel engines and related auxiliaries and their relationship to the engineering plant and their application for operating various shipboard systems. Theory of filling, storage, purification, transfer of fuels, lubricants, water, and study of the various piping systems and their maintenance.

Course Hours Per Week: Class 3, M. Lab 12. Quarter Hours Credit 7.
Prerequisite: Mde 1101

Mde 1103—Marine & Diesel Engines Theory & Practice: The administration of Gasoline & Diesel Engineering plants, through the recording and filing of performance data. Processing, recording, and storage of parts for the preventive maintenance program, and periodic inspections of machinery and component parts through the use of

precision tools to determine conditions due to wear, and the replacement of such components in conference with recommended standards set forth by the manufacturer.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisites: Mde 1101, Mde 1102

Mec 1101—Machine Shop Theory and Practice: An introduction to the machinist trade and the potential it holds for craftsmen. Deals primarily with the identification, care and use of basic hand tools and precision-measuring instruments. Elementary layout procedures and processes of lathe, drill press, grinding (off-hand) and milling machines will be introduced both in theory and practice.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: None

Mec 1102—Machine Shop Theory and Practice: Advanced operations in layout tools and procedures, power sawing, drill press, surface grinder, milling machine and shaper. The student will be introduced to the basic operations on the cylindrical grinder and will select projects encompassing all the operations, tools and procedures thus far used and those to be stressed throughout the course.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit, 8.
Prerequisite: Mec 1101

Mec 1103—Machine Shop Theory and Practice: Advanced work on the engine lathe, turning, boring and threading machines, grinders, milling machine and shaper. Introduction to basic indexing and terminology with additional processes on calculating, cutting and measuring of spur, helical, and worm gears and wheels. The trainee will use precision tools and measuring instruments such as vernier height gages, protractors, comparators, etc. Basic exercises will be given on the turret lathe and on the tool and cutter grinder.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: Mec 1102

Mec 1104—Machine Shop Theory and Practice: Development of class projects using previously learned procedures in planning, blueprint reading, machine operations, final assembly and inspection. Additional processes on the turret lathe, tool and cutter grinder, cylindrical and surface grinder, advanced milling machine operations, etc. Special procedures and operations, processes and equipment, observing safety procedures faithfully and establishing of good work habits and attitudes acceptable to the industry.

Course Hours Per Week: Class 4, M. Lab 12. Quarter Hours Credit 8.
Prerequisite: Mec 1103

Mec 1113—Shop Processes: Study of practices used in metalworking shops: introduction to how materials can be utilized, and to the processes of shaping, forming and fabricating of metals. Demonstration of the metalworking lathes, grinders, drills, milling machines, shapers, planers, saws, broachers, gear-cutting machines and finishing machines. A study of the capabilities of these machines.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Mec 1114—Shop Processes: Comparison of the unit-production and mass-production systems. Casting, forging and allied processes, welding and sheet metal working processes are demonstrated and discussed. Mass-production methods are studied in relationship to precision dimensional control.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: Mec 1113

Mec 1115—Applied Metallurgy: Investigates the properties of ferrous metals (steels and cast irons) and tests to determine their uses. Instruction will include methods of

changing physical characteristics and properties, production of iron and steel, methods of shaping and forming, heat and surface treatments, and classification of ferrous metals.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

Mec 1115-C—Applied Metallurgy: Investigates the properties of ferrous metals (steels and cast irons) and tests to determine their uses. Instruction will include methods of changing physical characteristics and properties, production of iron and steel, methods of shaping and forming, heat and surface treatments, and classification of ferrous metals.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Mec 1116-C—Applied Metallurgy: A continuation of the study of physical metallurgy dealing with the non-ferrous metals such as bearing metals (brass, bronze, lead), light metals (aluminum, titanium, magnesium, beryllium), copper, and nickel.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: Mec 1115-C

Mec 1131—Industrial Machine Operator I: An introduction to the Industrial Machine Operator Trade. Deals primarily with identification, care, and use of basic precision measuring instruments used in a quality controlled setting. Also included are elementary procedures and operations of drill press, saws, and lathe, both in theory and practice.

Course Hours Per Week: Class 3, M. Lab 9. Quarter Hours Credit 6.
Prerequisite: None

Mec 1132—Industrial Machine Operator II: An introduction to elementary procedures of various types of grinding machines, milling machines, holding devices, and accessories. Advanced procedures on lathe processes, quality control methods, and precision measuring instruments.

Course Hours Per Week: Class 5, M. Lab 9. Quarter Hours Credit 8.
Prerequisite: Mec 1131

Mro 1101—Rules of the Road and Piloting: This course is intended to familiarize the student with basic piloting techniques in the inland waterways, rivers, and sounds in particular. Special emphasis is on the Inland Rules of the Road because most waterborne marine construction movement is on these waters.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

Mro 1101-C—Rules of the Road and Piloting I: To acquaint the marine construction student with the rules and regulations and piloting techniques necessary to move waterborne marine construction equipment, particularly on inland waters.

Course Hours Per Week: Class 1, Lab 4. Quarter Hours Credit 3.
Prerequisite: None

Mro 1102—Electronic Aids to Navigation: A course designed to provide the student with general information on the operational concept and capabilities of shipboard electronic equipment used for navigation, communication, oceanography, and fishery operations.

Course Hours Per Week: Class 1, Lab 2. Quarter Hours Credit 2.
Prerequisite: None

Mro 1106—Practical Marine Engineering I: Introduction to the principles and fundamentals of construction, operation, maintenance, and repair of diesel engines and

their related equipment such as systems for fuel, lubrication, salt water and fresh water cooling. Also trouble-shooting, maintenance, repair, and overhaul of various types of diesel engines will be studied.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

Mro 1107—Practical Marine Engineering II: A continuation of Mro 1106 with more responsibility given to the student as an operator of the power plants on the many boats and other equipment belonging to the school. More opportunities for operation, maintenance, repair and overhaul are offered to the student in this segment of the Marine Engineering course.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: Mro 1106

Mro 1108—Practical Marine Engineering III: A basic course introducing the student to the principles and fundamentals of construction, operation, and maintenance of diesel engines and other related machines used in the propulsion system of oceanographic vessels. The subject matter relative to this course will be based on the engines and auxiliary equipment found on board the school ship "SS Advance II."

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: Mro 1107

Mro 1109—Practical Marine Engineering IV: A continuation of Mro 1108 to enable the student to operate, maintain, and repair gasoline and diesel engines. Pumps and generators are also covered and marine refrigeration is introduced to the student at this time.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: Mro 1108

Mro 1115—Towboat Operations: To demonstrate by actual practice the methods of securing tugs to one or more tows and maneuvering these tows upon rivers and harbors. The student will be instructed in the use of all signals given between tugs and tows and special rules of navigation pertaining to vessels towed and being towed will be stressed.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

Mro 1139—Rigging and Seamanship: Fibers, synthetics, and wire ropes are studied with emphasis on strength, proper handling, and storage. The types of splicing used in fiber and wire slings will be demonstrated. Block and tackle combinations and mathematical formulas used to lift given weights will be taught in this course.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

Mro 1139-C—Rigging and Seamanship: To assure the student will be capable of performing the various rigging operations required of a marine construction technician.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Mro 1140 Marine Safety—First Aid, Lifeboat Drills, and Firefighting Aboard Ship: The U.S. Coast Guard Rules and Regulations regarding fire drills and lifeboat drills are thoroughly demonstrated to the student. Practical first aid is also included in the course.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Msc 1104—Boat Design and Ship's Plans: This course provides basic knowledge needed by the amateur boat builder or a person purchasing his first boat. Essential

information is given for the most rudimentary boat, whether under power, sail, or simply propelled by oars.

Course Hours Per Week: Class 5. Quarter Hours Credit 5.
Prerequisite: None

Msc 1106—Introduction to Hand and Machine Woodworking Tools: This is a basic course designed to familiarize students with the hand and power tools which are used in many of the woodworking trades. Safety practices, nomenclature, maintenance, sharpening and proper uses of each tool will be studied and practiced in lecture and lab sessions.

Course Hours Per Week: Class 2, M. Lab 3. Quarter Hours Credit 3.
Prerequisite: None

Msc 1110—Boat Building I: This course provides the skills and articulations necessary for the students to construct a craft suitable for the intended purpose. Basic instructions will enable the student to continue to satisfy his curiosity into the intricacies of boat construction. Fundamentals for setting up a well-organized boat shop will be stressed with emphasis on safety and efficiency of operation.

Course Hours Per Week: Class 1, M. Lab 12. Quarter Hours Credit 5.
Prerequisite: None

Msc 1111—Boat Building II: To continue to emphasize the important points of boat building and to recognize boat building as a fine art.

Course Hours Per Week: Class 1, M. Lab 15. Quarter Hours Credit 6.
Prerequisite: Msc 1110

Msc 1112—Boat Building III: To further develop the mind and develop boat building skills necessary to compromise conflictions of materials, accommodations, seaworthiness, speed, and other qualities in order to build a boat.

Course Hours Per Week: Class 2, M. Lab 15. Quarter Hours Credit 7.
Prerequisite: Msc 1111

Msc 1113—Boat Building IV: The final achievement or culmination of the program, the finished product, the boat!

Course Hours Per Week: Class 1, M. Lab 21. Quarter Hours Credit 8.
Prerequisite: Msc 1112

Msc 1030—Navigation: Practical problems in relative movement and use of The Maneuvering Board. Radar plotting and use of information obtained from the radar. An introduction to Celestial Navigation covering such topics as the celestial sphere, systems of coordinates, navigational triangles, lines of position and computed and observed altitudes.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Msc 2001—Marine Fishery Science and Seafood Handling: Study of identification and classification of commercial marine fishes. General understanding of life cycles, population changes, and distributions as influenced by environmental factors. Additional study will be given in fish identification and fish tagging methods with an introduction to aquaculture and controlled rearing of commercially important marine species as a profitable business. Description of fisheries, fishing methods, fishing equipment, and methods of fish preservation will be covered.

Course Hours Per Week: Class 2, Lab 2. Quarter Hours Credit 3.
Prerequisite: None

Nur 1100—Nursing Procedures: Introduces the student to the concept of a safe environment for a patient before, during and after surgery. Acquaints the student with nursing procedures related to the operating room.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

Nur 1101—Practical Nursing I:

OBJECTIVES: To assist beginning students in practical nursing to acquire basic knowledge from nursing and from related areas of learning and to begin to develop the skills needed for safe and effective bedside care of patients whose health deviation has created a state of dependency in matters of daily living.

Course Material:
Nutrition
Nursing Skills—Introduction to patient care.
Health—Personal, physical and mental; family; community.
Basic Science—Body structure and function; bacteriology.
Vocational Adjustments—Introduction to ethics and legal aspects of nursing, history, Communication and Human Relations.

Classroom activities are planned to assist students in development of knowledge, understanding, appreciations, and attitudes basic to effective nursing of patients of all ages and backgrounds with nursing needs arising both from the individuality of the patient and from inability for self-care as a result of a health deviation. The student is encouraged to develop beginning skills in analysis of patients needs, both through classroom study of hypothetical patient situations and through planned patient experiences in the clinical environment. Beginning skills in nursing methods are developed through planned laboratory experiences, followed by related practice in actual patient care.

Clinical activities provide introduction to actual patient care through selected clinical assignments requiring application of current classroom and laboratory learnings.

Course Hours Per Week: Class 25, Lab 2, Clinic 3. Quarter Hours Credit 27.
Prerequisite: Admission requirements

Nur 1102—Practical Nursing II:

OBJECTIVES: To assist practical nursing students to acquire further knowledge and understanding and to develop further skills needed for rendering safe and effective nursing care to patients of all ages.

Course Material:

Medical—Surgical I
Pediatrics I, II, III

Classroom activities center around analysis of nursing needs as viewed in perspective with the needs arising from the individuality of the patient and from the illness condition. Related information is presented as it is relevant to the student's understanding of and ability to meet nursing needs of patients.

Clinical activities provide selected experiences in patient care in order for the student to develop skill in applying classroom learnings to a variety of patient situations.

Course Hours Per Week: Class 12, Lab 2, Clinic 21. Quarter Hours Credit 20.
Prerequisite: Nur 1101

Nur 1103—Practical Nursing III:

OBJECTIVES: To assist practical nursing students to acquire knowledge of common disease conditions and to develop beginning skills in rendering safe and effective nursing care to patients of all ages with specific needs arising from the illness and/or therapy.

Course Material:

Medical—Surgical II
Obstetrics
Drugs and Drug Administration

Classroom activities center around analysis of nursing needs arising from the specific illness condition and the medical plan.

Clinical activities consist of guided experiences in nursing patients with conditions which illustrate classroom learnings.

Course Hours Per Week: Class 10, Lab 2, Clinic 24. Quarter Hours Credit 19.
Prerequisite: Nur 1102

Nur 1104—Practical Nursing IV:

OBJECTIVES: To assist advanced practical nursing students to acquire knowledge of needs of patients who are seriously ill, to develop beginning skills in assisting the registered nurse and/or physician in complex nursing situations, and to make the transition to the role of graduate practical nurse.

Course Material:

Medical—Surgical II and III
First Aid
Civil Defense

Classroom activities center around the needs of seriously-ill patients of all ages, of labor patients, and of patients immediately following surgery.

Clinical activities consist of guided experiences in the care of seriously-ill patients, labor patients, and surgery patients, and is planned to parallel classroom learnings whenever possible.

Course Hours Per Week: Class 10, Lab 2, Clinic 24. Quarter Hours Credit 19.
Prerequisite: Nur 1103

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include: measurement, properties of solids, liquids, and gases, and basic electrical principles.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: None

Phy 1101-C—Applied Science: This course is an introductory, descriptive course which emphasizes the physical principles of matter and the applications of these principles in industry. The topics discussed in this course are measurement, properties of solids, liquids and gases, work, and the principles and uses of simple machines.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Phy 1102—Applied Science: The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: Phy 1101

Phy 1102-C—Applied Science: This course includes the following topics: power, energy, motion, heat and themometry, elementary electricity and emphasizes applications of these principles in industry.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: Phy 1101-C

Phy 1105—Applied Science: This course gives the student a fundamental knowledge of some physical principles important to the operation of electronic devices for home entertainment. Some topics included in the course are: ray optics, colors and color mixing, sound frequency wavelength and velocity, and the decibel scale for measuring loudness.

Course Hours Per Week: Class 3, Lab 2. Quarter Hours Credit 4.
Prerequisite: Mat 1110

Pme 1101—Internal Combustion Engines: Development of a thorough knowledge and ability in using, maintaining, and storing the various hand tools and measuring devices needed in engine repair work. Study of the construction and operation of components of internal combustion engines. Testing of engine performance servicing and maintenance of pistons, valves, cams and camshafts, fuel and exhaust systems, cooling systems; proper lubrication, and methods of testing, diagnosing and repairing.

Course Hours Per Week: Class 3, M. Lab 15. Quarter Hours Credit 8.
Prerequisite: None

Pme 1102—Engine Electrical and Fuel Systems: A thorough study of the electrical and fuel systems of the automobile. Battery cranking mechanism, generator, ignition, accessories and wiring; fuel pumps, carburetors, and fuel injectors. Characteristics of fuels, types of fuel systems, special tools, and testing equipment for the fuel and electrical system.

Course Hours Per Week: Class 5, M. Lab 15. Quarter Hours Credit 10.
Prerequisite: None

Pme 1131—Schematics and Diagrams: Marine and Diesel: Interpretation and reading of blueprints. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Pme 1136—Fundamentals of Hydraulics: Fundamentals of hydraulics and its use to transmit power. Study of components and their function; pumps, lines, cylinders, valves, gauges and controls. Proper care, use, installation and storage of test equipment. Minor repairs, assembly removal and replacement.

Course Hours Per Week: Class 3, M. Lab 6. Quarter Hours Credit 5.
Prerequisite: None

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.

Course Hours Per Week: Class 3. Quarter Hours Credit 3.
Prerequisite: None

Psy 1101-C—Human Relations: A study of basic principles of human behavior including relationships in society, group membership, and the work situation.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

Psy 1104—Job Adjustment Skills: This course is designed to familiarize the students with report writing, ordinary conversation, practical psychology, economics, labor relations, etc. It is intended to indoctrinate the student with the kinds of relationships he will encounter between employer and employee.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: None

Shi 1101—Ships' Equipment, Maintenance and Repair I: Personnel working in the marine field will often be called upon to operate equipment such as a forklift, crane, generator, air compressor, or even to operate a small boat. He will often be responsible for maintaining the equipment and to assist in effecting repairs in the event of a "breakdown" or damage to the equipment.

Course Hours Per Week: Class 1, M. Lab 9. Quarter Hours Credit 4.
Prerequisite: None

Shi 1102—Ships' Equipment, Maintenance, and Repair II: Personnel working in

the marine field will often be called upon to operate equipment such as a forklift, crane, generator, air compressor, or even to operate a small boat. He will often be responsible for maintaining the equipment and to assist in effecting repairs in the event of a "breakdown" or damage to the equipment. The student completing this course of study will have some knowledge and skills necessary to operate, maintain, and repair equipment used in the marine environment.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: Shi 1101

Shi 1103—Ships' Equipment, Maintenance, and Repair III: A continuation from Shi 1102. The student completing this course of study will have the knowledge and skill necessary to operate, maintain, and repair equipment used in the marine environment.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: Shi 1102

Shi 1104—Ships' Equipment, Maintenance, and Repair IV: A continuation from Shi 1103. The student completing this course of study will have the knowledge and skill necessary to operate, maintain, and repair equipment used in the marine environment.

Course Hours Per Week: M. Lab 9. Quarter Hours Credit 3.
Prerequisite: Shi 1103

Sur 1101—Introduction to Operating Room: A course designed to introduce the student to the environment of the operating room through the study of the history of surgery, knowledge of terminology, care of instruments and proper dress. Also included are moral, ethical, and legal responsibilities of the technician. Laboratory time is provided to insure active application of those techniques and practices studied in theory.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: None

Sur 1102—Surgical Procedures I: The student will be able (1) to identify the anatomy and physiology of the body systems as they relate to the surgical procedures being learned; (2) apply the principles of asepsis to new skills and technical procedures in scrubbing and circulating; and (3) acquire an understanding of major surgical procedures including special instructions, instruments and equipment.

Course Hours Per Week: Class 5, Lab 2. Quarter Hours Credit 6.
Prerequisite: None

Sur 1103—Surgical Procedures II: Sur 1103 is a continuation of Sur 1102, so the objectives are the same, namely: (1) identify the anatomy and physiology of the body systems as they relate to the surgical procedures being learned; (2) understand the pathology of the organs that requires the surgical procedure; and (3) acquire an understanding of major surgical procedures including special instructions, instruments and equipment.

Course Hours Per Week: Class 4, Lab 2. Quarter Hours Credit 5.
Prerequisite: Sur 1102

Sur 1104—Clinical Practice I: Allows the student an opportunity to apply learned theory to the clinical setting.

Course Hours Per Week: Clinical 15. Quarter Hours Credit 5.
Prerequisite: Sur 1103

Sur 1105—Clinical Practice II: Sur 1105 is a continuation of Sur 1104 which allows the student an opportunity to apply learned theory to the clinical setting, namely, the surgical suites in the local hospitals.

Course Hours Per Week: Clinical 24. Quarter Hours Credit 8.
Prerequisite: Sur 1104

Sur 1106—Suggested Seminar I: This seminar time will be used in review of

experience received in Surgical Procedures and Clinical Practice.

Course Hours Per Week: Class 2. Quarter Hours Credit 2.
Prerequisite: Sur 1105

Sur 1107—Lecture Seminar: This seminar will be planned by the instructor as a review of those surgical procedures with which the student has been in contact during his clinical experience.

Course Hours Per Week: Class 1. Quarter Hours Credit 1.
Prerequisite: Sur 1106

Wld 1101—Basic Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding, bronze welding, silver soldering, and flame-cutting methods applicable to mechanical repair work.

Course Hours Per Week: Class 1, M. Lab 3. Quarter Hours Credit 2.
Prerequisite: None

Wld 1101-C—Basic Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding; bronze welding, silver-soldering, and flame-cutting methods applicable to mechanical repair work.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

Wld 1106—Welding and Burning I: Welding demonstrations by the instructor and practice by students in the welding shop. Metallurgy of welding discussed. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding and flame cutting. Emphasis on electric arc and gas welding methods applicable to mechanical repair work. Brazing also covered.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

Wld 1107—Welding and Burning II: This course is designed to familiarize the students with types of equipment, safety required, efficiency, cost of operations, and to stress the importance of being a qualified welder before taking the task of underwater welding, cutting, or burning. Emphasis will be placed on safety because of the hazards of using extreme voltage and amperage around, above, and below the surface of fresh and salt water.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None

Wld 1108—Basic Inert Gas Welding for Marine Applications: Introduction and practical operations in the use of inert-gas-shield arc welding of stainless steel and aluminum as applied to manufacturing small vessels. A study of equipment, operation, and practice in the flat position using filler rods and material closely associated with the corrosive action of sea water.

Course Hours Per Week: Class 1, M. Lab 21. Quarter Hours Credit 8.
Prerequisite: None

Wld 1120—Oxyacetylene Welding and Cutting: Introduction to the history of oxyacetylene welding, the principles of welding and cutting, nomenclature of the equipment, assembly of units. Welding procedures such as practice of puddling and carrying the puddle, running flat beads, butt welding in the flat, vertical and overhead position, brazing, hard and soft soldering. Safety procedures are stressed throughout the program of instruction in the use of tools and equipment. Students perform mechanical testing and inspection to determine quality of the welds.

Course Hours Per Week: Class 4, M. Lab 12. Quarter Hours Credit 8.
Prerequisite: None

Wld 1121—Arc Welding: The operation of AC transformers and DC motor generator arc welding sets. Studies are made of welding heats, polarities, and electrodes for use in joining various metal alloys by the arc welding process. After the student is capable of running beads, butt and fillet welds in all positions are made and tested in order that the student may detect his weaknesses in welding. Safety procedures are emphasized throughout the course in the use of tools and equipment.

Course Hours Per Week: Class 4, M. Lab 12. Quarter Hours Credit 8.
Prerequisite: None

Wld 1122—Commercial and Industrial Practices: Designed to build skills through practices in simulated industrial processes and techniques: sketching and laying out on paper the size and shape description, listing the procedure steps necessary to build the product, and then actually following these directions to build the product. Emphasis is placed on maintenance, repairing worn or broken parts by special welding applications, field welding and nondestructive tests and inspection.

Course Hours Per Week: M. Lab 3. Quarter Hours Credit 1.
Prerequisite: None

Wld 1123—Inert Gas Welding (Tig, Mig, Plasma): Introduction and practical operations in the use of inert-gas arc welding. A study will be made of the equipment, operation, safety and practice in the various positions. A thorough study of such topics as: principles of operation, shielding gases, filler rods, process variations and applications, manual and automatic welding.

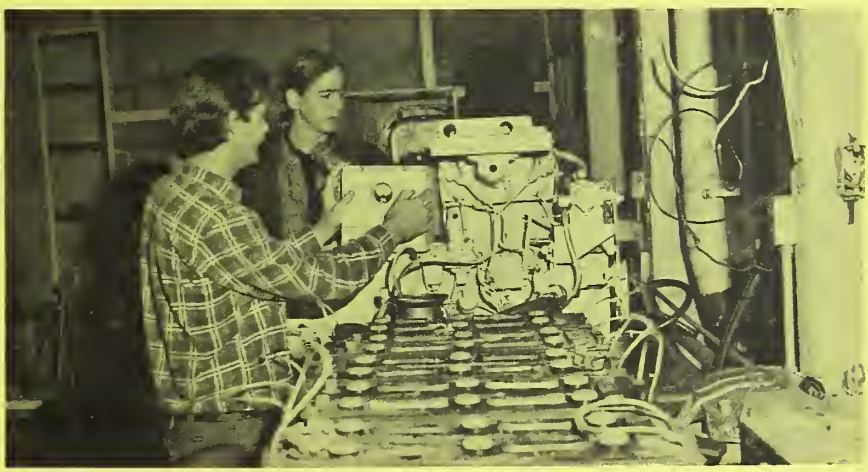
Course Hours Per Week: Class 4, M. Lab 9. Quarter Hours Credit 7.
Prerequisite: None

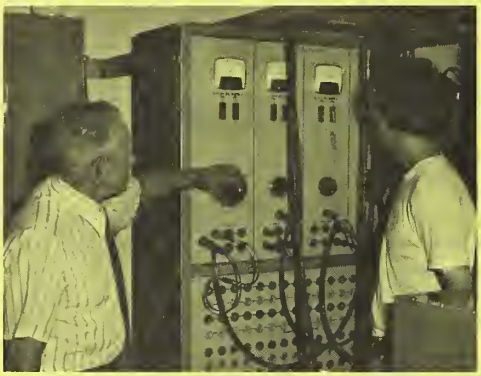
Wld 1124—Pipe Welding: Designed to provide practice in the welding of pressure piping in the horizontal, vertical and horizontal-fixed position using shielded metal arc welding processes according to Sections VIII and IX of the ASME code.

Course Hours Per Week: Class 4, M. Lab 6. Quarter Hours Credit 6.
Prerequisite: None

Wld 1125—Certification Practices: This course involves practice in welding the various materials to meet certification standards. The student uses various tests including the guided bend and the tensile strength tests to check the quality of his work. Emphasis is placed on attaining skill in producing quality welds.

Course Hours Per Week: M. Lab 6. Quarter Hours Credit 2.
Prerequisite: None





EXTENSION & GENERAL ADULT EDUCATION DIVISION

CONTINUING EDUCATION

The Cape Fear Technical Institute provides training in numerous areas through its Continuing Education programs. Classes are held both at the school and at various locations throughout New Hanover, Brunswick and Pender Counties. These classes are designed to prepare individuals for employment or to upgrade workers already employed.

The Continuing Education Division also serves area industries and public agencies by providing training for their employees. Training under this division of the Institute can be offered at any time a need for such training is established. Full details can be obtained by contacting the Dean of Continuing Education programs at the school.

Admission Requirements

Generally speaking any individual who is 18 years of age or whose high school class has graduated is eligible for admission to extension classes; applicants are usually admitted on the first come, first served basis. Some classes may have specific admission requirements, in such cases the Director of Continuing Education programs will inform applicants of these requirements.

Expenses

Many of the Continuing Education classes are offered without charge to the students. In other cases, a $5.00 tuition fee is charged. Any charges should be paid at the first class session.

Certificates

The Continuing Education Division issues certificates to those who complete a course satisfactorily.

EXAMPLES OF EXTENSION PROGRAMS OFFERED

Air Conditioning & Refrigeration
Aircraft Assembly
Auto Mechanics
Auto Electricity
Basic Electronics
Blueprint Reading
Commercial Fishing
Crab Processing
Electricity
Electronic Circuits
Furniture Upholstery
Instrumentation
Janitorial Maintenance
Loom Fixing
Machine Shop Practice
Marine Diesel Mechanics
Metal Burning
Net-Making & Mending
Power Sewing
Slide Rule
Small Engine Repair
Supervisory Development Courses
Tailoring
Tourist Serving Training
Waitress Training

AGRICULTURAL

Farm Records
Fertilizers and Lime
Pesticides
Welding for Farmers
Ornamental Horticulture

BUSINESS

Typing
Bookkeeping
Shorthand

CONSTRUCTION

Bricklaying
Carpentry
Housewiring
Plumbing

PUBLIC AGENCIES

Fire Training
Fire Officer Training
Fire First Aid
Nurses' Aide
Orderlies Training
Police Training
Teacher Aides

SUPERVISORY DEPARTMENT

The Art of Motivating People
Effective Writing
Effective Speaking
Human Relations
Industrial First Aid
Effective Communications
Job Methods
Industrial Safety & Accident Prevention
Job Analysis Training
Work Measurement

This list, of course, is in no way comprehensive, but is offered as a general sample of extension-type courses. For further information on this division contact the Dean of Continuing Education.

GENERAL ADULT EDUCATION

The General Adult Education division of the Cape Fear Technical Institute is primarily concerned with raising the educational level of adults and providing cultural improvement courses. The Institute is prepared to provide training at all educational levels from grade one (learning to read and write) up through high school equivalency. This training is provided through organized classes and through the school's Programmed Instruction Centers.

HIGH SCHOOL EQUIVALENCY CERTIFICATE

The State of North Carolina, through the State Board of Education permits adults (18 years of age) to take the General Educational Development Tests, (generally referred to as "the High School Equivalency Examination") at test centers throughout the State. Persons who make satisfactory scores on all five sections of the test are issued the High School Equivalency Certificate by the State Board of Education. This certificate is recognized by most industries, schools, and government agencies as meeting their requirement for a high school education. Cape Fear Technical Institute is a G.E.D. test center. The test is generally given once each month; applications for the tests may be obtained from the Institute or from the office of any school superintendent.

The Institute provides training in the five areas covered by the examination both through organized classes and the Learning Laboratory.

ORGANIZED CLASSES

Classes in adult education are organized as follows:

Basic Education I—For those adults who have completed less than four grades of formal education.

Basic Education II—For those adults who stopped school in grades 5-8 or who have completed Basic Education I.

Secondary I—For those adults who stopped in grades 9-10 or who have completed Basic Education II.

Secondary II-GED preparation—For adults who want to complete their high school education.

The Programmed Instruction Center provides training for those who are not able to attend the organized classes. See the Programmed

Instruction Center.

In addition to the organized classes in GED preparation, the Continuing Education Department offers a large variety of courses both at the school and throughout the area it serves. The types and frequency of these offerings are determined by the demand and interest in a given area of study. A sampling of courses under this heading would include:

Law for the Layman
Homemaking—Sewing and Food Preparation
Driver Education for Adults
Remedial Mathematics
Remedial English
Conversational French
Conversational Spanish
Creative Art
Creative Writing
Citizenship Studies for Naturalization
Interior Decorating for Homeowners
First Aid
Auto Mechanics for Car Owners
Ceramic Arts and Crafts

Additional courses are offered as the demand becomes evident. Details of these and other courses may be obtained from the Directors of Continuing Education.

Admission Requirements

Any adult who has a desire to raise his or her educational level and who is able to benefit from a course may enroll in the general adult classes.

Expenses

There is no charge for the Basic Education and only a small fee to cover the cost of instructional materials in the Secondary I and II classes. Charges for other general adult classes are determined by the length of the course and instructional materials needed.

PROGRAMMED INSTRUCTION CENTER

The Cape Fear Technical Institute Programmed Instruction Center —A Brief Summary of What It Is

The Programmed Instruction Center at the Cape Fear Technical Institute is designed to provide study opportunities in practically any field that might be of interest to residents of the New Hanover, Pender or Brunswick County area.

Persons interested in participating in the Programmed Instruction Center, after an initial interview, are provided study materials starting at a point in keeping with their achievement level and are able to progress from there. Students may elect study times adjusted to their convenience and schedules.

A "Programmed Instruction Center" is essentially an individual study situation, in which any person eighteen years of age or older may undertake most any level of Reading, English, Math, Social Studies, or Science that he desires. All of the material used in the lab is programmed; therefore, there is no need for a classroom teacher. In fact, efforts have been made to remove all semblances of a classroom from the Programmed Instruction Center.

Programmed material is designed in such a manner as to aid the student in learning information in small sequences called "Frames." Each frame requires an immediate response, and each response is immediately checked. If the student fails to learn, or learns incorrectly, the program makes the correction or re-teaches. In this manner the student progresses at his own rate; he neither has to wait for others to catch up nor slow down to someone else's rate.

The coordinator, the person in charge of the Programmed Instruction Center, has the responsibility of locating the level at which a student can proceed to learn by himself, of formulating the sequence of programs the student will undertake to achieve his desired goal, and of administering the tests that will assure the student that he is approching his goal.

Because there are no classes in the learning lab, there is no need for anyone to wait until the new quarter to enroll. Each student sets his own work sessions and attends the lab as many days each week and as many hours each day as he thinks he can attend regularly. There are no fees, and any adult can take as many courses as fit his needs.

The majority of students presently enrolled in Programmed Instruction Center are seeking to prepare themselves for the high school equivalency examination or to gain educational improvement of their own choosing. Some, however, are enrolled to upgrade

themselves for a possible job promotion; while others are using the program for reinforcement in a technical institute curriculum or in their college work.

Admission Requirements for Programmed Instruction Center

Any adult over 18 years of age who has a desire to raise his or her educational level and who is able to benefit from study in the Programmed Instruction Center may enroll.

Expenses

There is no charge for study in the Programmed Instruction Center.

Courses

Some of the fields in the Programmed Instruction Center are: Mathematics, English, Foreign Languages, Reading Improvement, Social Sciences, Natural Sciences, Nursing Electronics, and Business. Courses are added almost daily. There are over 400 different courses offered now.

Locations

There are two Programmed Instruction Centers in operation now. One is in the main building of Cape Fear Technical Institute and the other at Cape Fear Technical Institute Facility in Burgaw.

New Industry Training

One of the basic objectives of Cape Fear Technical Institute is to stimulate the creation of more challenging and rewarding jobs for the people of our area by providing a customized training service to new and expanding industries. Subject to only minimal limitations, this institution, in cooperation with the Industrial Services Division of the State Department of Community Colleges, will design and administer a special program for training the production manpower required by any new or expanding industry creating new job opportunities in North Carolina.

This program includes the following services:

1. Consultation in determining job descriptions; defining areas of training; and in prescribing appropriate course outlines, training schedules, and materials.

2. Selecting and training of instructors. These instructors may be recruited from the company and from outside sources.
3. Payment of instructors' wages for the duration of the training program.
4. Provision of suitable space for a temporary training facility prior to the completion of the new plant, should such temporary space be required. This may be space with Cape Fear Technical Institute or leased space in the community.
5. Assumption of installation costs of equipment in the temporary training facility.
6. Payment for one-half the cost of nonsalvageable materials expended in the training program.

The purpose of this service is to help a new or expanding industry meet its immediate manpower needs and to encourage each industry to develop a long-range training program of its own to satisfy its continuing replacement and re-training needs.

For further details of this service, please contact the President, Cape Fear Technical Institute or the Director, Industrial Services Division, North Carolina Department of Community Colleges, Raleigh, North Carolina.

Human Resources Development Program

The Human Resources Development Program, at Cape Fear Technical Institute, is designed to provide 240 hours of carefully structured pre-vocational training/counseling and assistance in placement into permanent employment or further educational training for chronically unemployed and underemployed adults.

The primary objective of H.R.D. is to help the jobless trainee reorient himself to the world of work through recognition of self-assets and limitations, understanding the effect of his behavior, on others, familiarization with problem-solving processes, and development.

H.R.D. operates in cooperation with local, state, and federal agencies.

For further information, please contact Rick Stewart, Director, Human Resources Development Program, Cape Fear Technical Institute.

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